PIONEER
The Art of Entertainment

Service Manual

ORDER NO.
ARP2181

MULTI–CASSETTE CHANGER

CT-M55R KUC, SD

- **Refer to the service manual ARP1890, CT–M6R.**
- **This manual is applicable to the KUC and SD types.**

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS SERVICE INC. P.O. Box 1760, Long Beach, California 90801 U.S.A.
PIONEER ELECTRONICS OF CANADA, INC. 505 Cochrane Drive, Markham, Ontario L3R 8E3 Canada
PIONEER ELECTRONIC [EUROPE] N.V. Keetberglaan 1, 2740 Beveren, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia TEL: [03] 580-9911
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1. CONTRAST OF MISCELLANEOUS PARTS

NOTES:
- Parts without part number cannot be supplied.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

The CT–M55R/KUC and SD types are the same as the CT–M6R/KUC type with the exception of the following sections.

Mark	Symbol & Description	Part No.			Remarks
		CT–M6R/ KUC type	CT–M55R/ KUC type	CT–M55R/ SD type	
	Amp unit	Non supply	Non supply	Non supply	
	Control unit	Non supply	Non supply	Non supply	
	HP. jack unit	Non supply	······	······	
	Remo–con unit	Non supply	······	······	
	Sub unit	Non supply	Non supply	Non supply	
⚠	Strain relief	CM–22C	CM–22C	CM–22B	
⚠	AC Power cord	PDG1015	PDG1015	PDG1013	
⚠	Voltage selector	······	······	PSB1002	
⚠	FU501, FU502 Fuse (1.5A)	REK1001	REK1001	······	
⚠	FU501, FU502 Fuse (1.6A)	······	······	REK–102	
⚠	T1 Power transformer (AC120V)	RTT1115	RTT1115	······	
⚠	T1 Power transformer (AC110/120–127/220/240V)	······	······	RTT1131	
	Insulator	PNW1376	······	······	
	Leg assembly	······	REC–369	REC–369	
	Slide knob (A)	RAC1457	RAC1603	RAC1603	
	Door lens	RAH1569	RAH1818	RAH1818	
	FL lens	RAH1570	RAH1816	RAH1816	
	Remote control panel	RAH1571	······	······	
	Door cover	RNK1547	RNK1714	RNK1714	
	Tray plate	RNK1548	RNK1694	RNK1694	
	Front panel assembly	RXX1308	RXX1362	RXX1362	
	Stopper	VEC1061	······	······	
	Insulator	VNK1095	······	······	
	Packing case	RHG1152	RHG1257	RHG1258	
	Plustic bag	RHL1001	······	······	
	Remote control unit	RPX1035	······	······	
	Case (C)	VNK–634	······	······	
	Operating instructions (English)	RRB1054	······	······	
	Operating instructions (English)	······	RRB1085	RRB1085	
	Operating instructions (Spanish)	······	······	RRD1094	
	Mechanism unit	Non supply	Non supply	Non supply	

AMP UNIT

The amp units (for CT–M55R/KUC and SD types) are the same as the amp unit (for CT–M6R/KUC type) with the exception of the following sections.

Mark	Symbol & Description	Part No.		Remarks
		CT–M6R/ KUC type	CT–M55R/KUC and SD types	
	IC201	M5218AP	······	
	IC401	UPC1297CA	······	
	Q251, Q252	2SD1302	······	
	Q451	DTC124ES	······	
	Q453, Q454	2SA933S	······	
	D451, D452	1SS254	······	
	L402 Oscillator coil	RTD1022	RTD1043	
	L403, L404 Step–up coil	RTD1028	······	
	C251, C252, C469	CEASR10M50	······	
	C253–C255	CEAS101M25	······	
	C325, C326	CFTXA822J50	CFTXA682J50	
	C335, C336	CFTXA392J50	CFTXA472J50	
	C406	CFTXA682J50	CFTXA472J50	
	C407	CFTXA273J50	CFTXA223J50	
	C408	CQPA682J100	CQPA752J100	
	C409, C410	······	CCCSL221K500	
	C451, C453	CEAS100M50	······	
	C452	CEAS4R7M50	······	
	C455, C456	CKPUYB821K50	······	
	C457, C458	CKCYF103Z50	······	
	C459, C460	CFTXA223J50	······	
	C461, C462	CKCYF473Z50	······	
	C463, C464	CCCSL101K500	······	
	C465, C466 (430P/500V)	RCG1005	······	
	C467	CKPUYB101K50	······	
	R251–R254, R459, R460	RD1/6PM184J	······	
	R255, R256	RD1/4PM470J	······	
	R257, R258	RD1/6PM182J	······	
	R259, R261	RD1/4PM431J	······	
	R407	RD1/2PMF221J	RD1/2PMF131J	
	R408	RD1/2PMF151J	RD1/2PMF820J	
	R412, R413	RD1/6PM5R6J	RD1/6PM4R7J	
	R414, R415	RD1/6PM333J	RD1/6PM153J	
	R451, R452, R455	RD1/6PM472J	······	
	R453, R457, R458	RD1/6PM223J	······	
	R454	RD1/6PM103J	······	
	VR401, VR402 (100k)	······	VRTB6HS104	
	VR451, VR45 (22k)	VRTB6HS223	······	

CONTROL UNIT

The control units (for CT–M55R/KUC and SD types) are the same as the control unit (for CT–M6R/KUC type) with the exception of the following sections.

Mark	Symbol & Description	Part No.		Remarks
		CT–M6R/ KUC type	CT–M55R/KUC and SD types	
	IC503	MC7805CT	TA7805S	
	Q612–Q614	2SC1740S	······	
	C617–C619	CKCYF103Z50	······	
	C624	CEAS330M16	······	
	R511	RD1/4PM102J	RS1/2LMF102J	
	R639	RD1/6PM472J	······	
	R640, R647	RD1/6PM103J	······	
	R641	RD1/6PM471J	······	
	R642	RD1/6PM221J	······	
	R643	RD1/2LF473J	······	
	R644	RD1/6PM683J	······	
	R645	RD1/6PM224J	······	
	R646	RD1/6PM181J	······	
	R648	RD1/6PM272J	······	
	VR601	VRTB6VS223	······	

SUB UNIT

The sub units (for CT–M55R/KUC and SD types) are the same as the sub unit (for CT–M6R/KUC type) with the exception of the following sections.

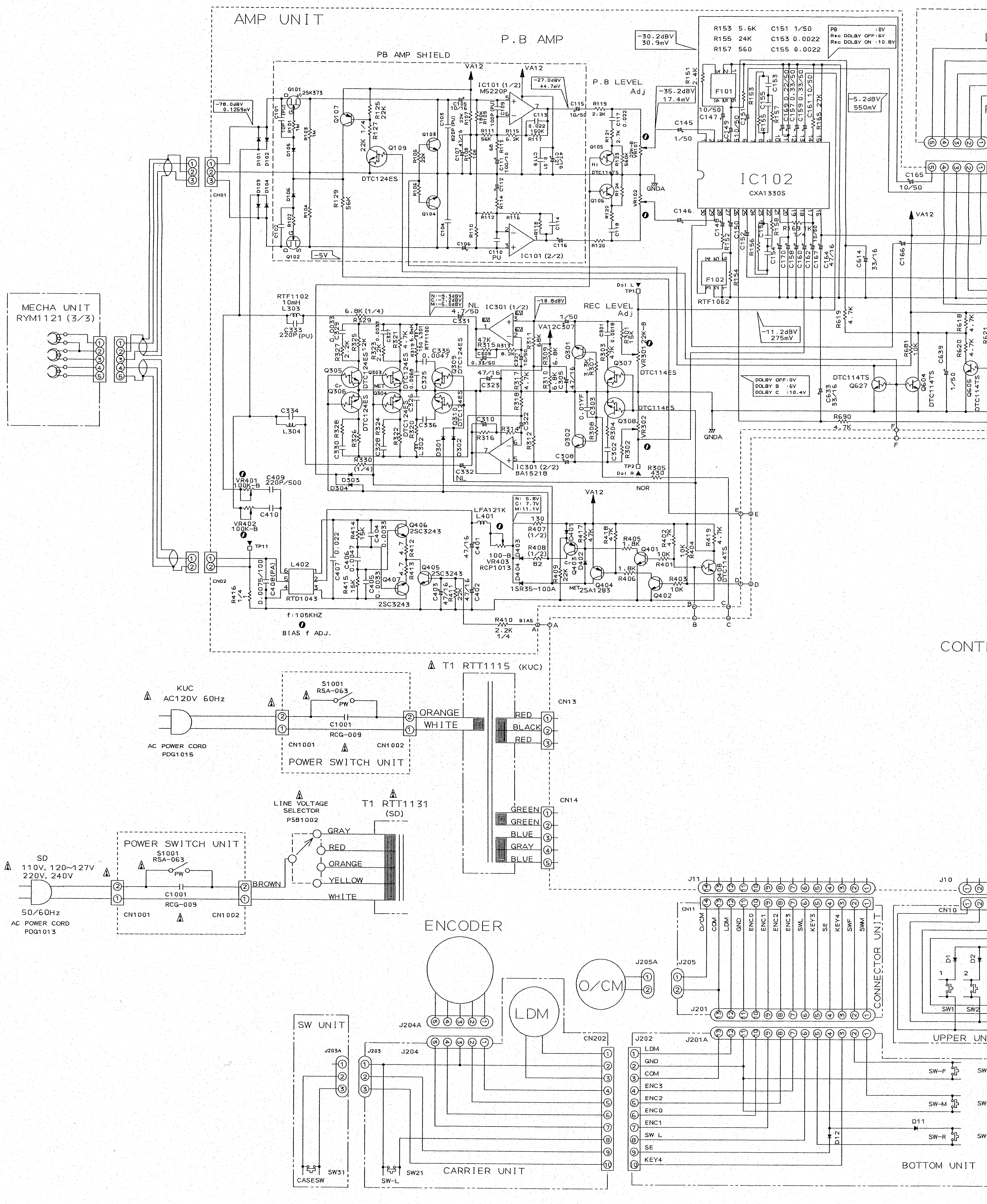
Mark	Symbol & Description	Part No.		Remarks
		CT–M6R/ KUC type	CT–M55R/KUC and SD types	
	Q705–Q708	2SC1740S	······	
	S724 Slide switch	RSH1008	RSH1032	
	R704	RD1/6PM121J	RD1/6PM104J	
	R705, R707, R709, R711	RD1/6PM473J	······	
	R706, R708, R710	RD1/6PM121J	······	
	V701 Fluorescent indicator	RAW1037	RAW1068	

MECHANISM UNIT

The mechanism units (for CT–M55R/KUC and SD types) are the same as mechanism unit (for CT–M6R/KUC type) with the exception of the following sections.

Mark	Symbol & Description	Part No.		Remarks
		CT–M6R/ KUC type	CT–M55R/KUC and SD types	
	Holder cushion (L)	······	RED1027	
	HD FPC (R/P)	RNP1232	······	
	R/P, E head	RPB1030	······	
	Quick sensor	SPI–320–AB	······	
	Head assembly	······	RXA1378	

2. SCHEMATIC DIAGRAM



AMP UNIT
P.B AMP
PB AMP SHIELD
P.B LEVEL Adj
REC LEVEL Adj
IC101 (1/2) M5220P
IC101 (2/2)
IC102 CXA1330S
IC301 (1/2)
IC301 (2/2) BA15218
MECHA UNIT RYM1121 (3/3)
CN01
CN02
RTD1043
f:105KHZ
BIAS f ADJ.
RTF1102 10mH L303
RTF1062
F101
F102
R153 5.6K
R155 24K
R157 560
C151 1/50
C153 0.0022
C155 0.0022
PB :0V
Rec DOLBY OFF:6V
Rec DOLBY ON :10.8V
DOLBY OFF:0V
DOLBY B :6V
DOLBY C :10.4V
-78.0dBV 0.1259mV
-27.0dBV 44.7mV
-30.2dBV 30.9mV
-35.2dBV 17.4mV
-5.2dBV 550mV
-11.2dBV 275mV
-18.8dBV
VA12
GNDA
NOR
NL
Q101 2SK373
Q102
Q107
Q109 DTC124ES
Q105
Q106 DTC114TS
Q305
Q306
Q307 DTC114ES
Q308 DTC114ES
Q309 DTC124ES
Q310 DTC124ES
Q401
Q402
Q403
Q404 2SA1283
Q405 2SC3243
Q406 2SC3243
Q407 2SC3243
Q408 DTC114TS
Q604 DTC114TS
Q605 DTC114TS
Q627 DTC114TS
LFA121K L401
L402
VR401 100K-B
VR402 100K-B
VR403 RCP1013
1SR35-100A
T1 RTT1115 (KUC)
KUC AC120V 60Hz
AC POWER CORD PDG1015
S1001 RSA-063
C1001 RCG-009
CN1001
CN1002
POWER SWITCH UNIT
ORANGE
WHITE
RED
BLACK
GREEN
BLUE
GRAY
CN13
CN14
LINE VOLTAGE SELECTOR PSB1002
T1 RTT1131 (SD)
SD 110V, 120~127V 220V, 240V 50/60Hz
AC POWER CORD PDG1013
BROWN
YELLOW
ENCODER
LDM
O/CM
SW UNIT
CASESW
SW31
CARRIER UNIT
SW-L
SW21
J203A
J203
J204
J204A
J205
J205A
CN202
J201
J201A
J202
J11
CN11
J10
CN10
CONNECTOR UNIT
O/CM
COM
LDM
GND
ENC0
ENC1
ENC2
ENC3
SWL
KEY3
SE
KEY4
SWF
SWM
SW L
BOTTOM UNIT
SW-F
SW-M
SW-R
D11
D12
UPPER UNIT
SW1
SW2
D1
D2
CONT

1. RESISTORS :
   Indicated in Ω, 1/4W, 1/8W, ±5% tolerance unless otherwise noted k ; kΩ, M ; MΩ, (F) ; ±1%, (G) ; ±2%, (K) ; ±10%, (M) ; ±20% tolerance.

2. CAPACITORS :
   Indicated in capacity (μF) /voltage (V) unless otherwise noted p ; pF.
   Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE CURRENT :
   ▭ ; DC voltage (V) at no input signal.
   ←mA ; DC current at no input signal.

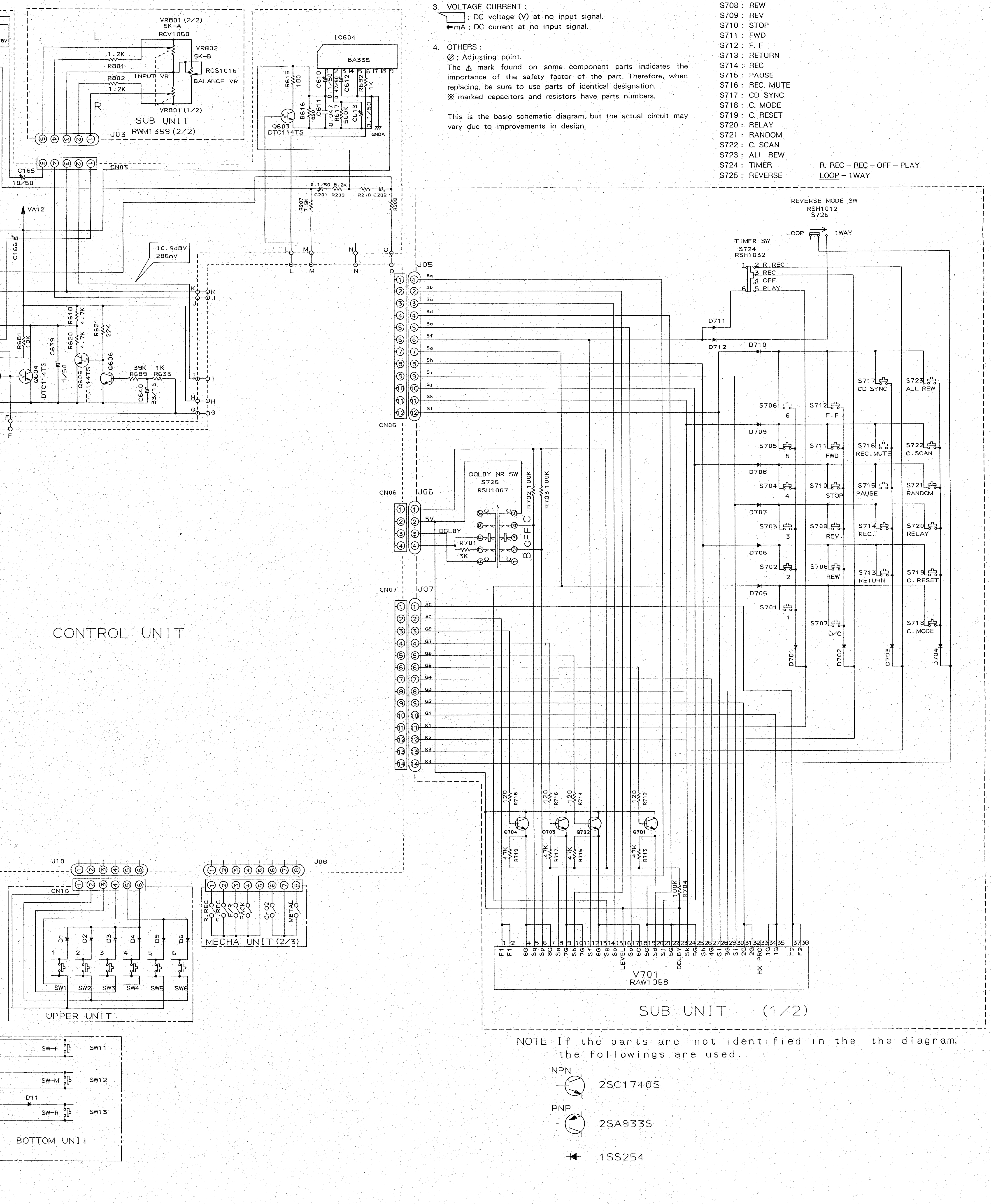
4. OTHERS :
   ⊘ ; Adjusting point.
   The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
   ※ marked capacitors and resistors have parts numbers.

   This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

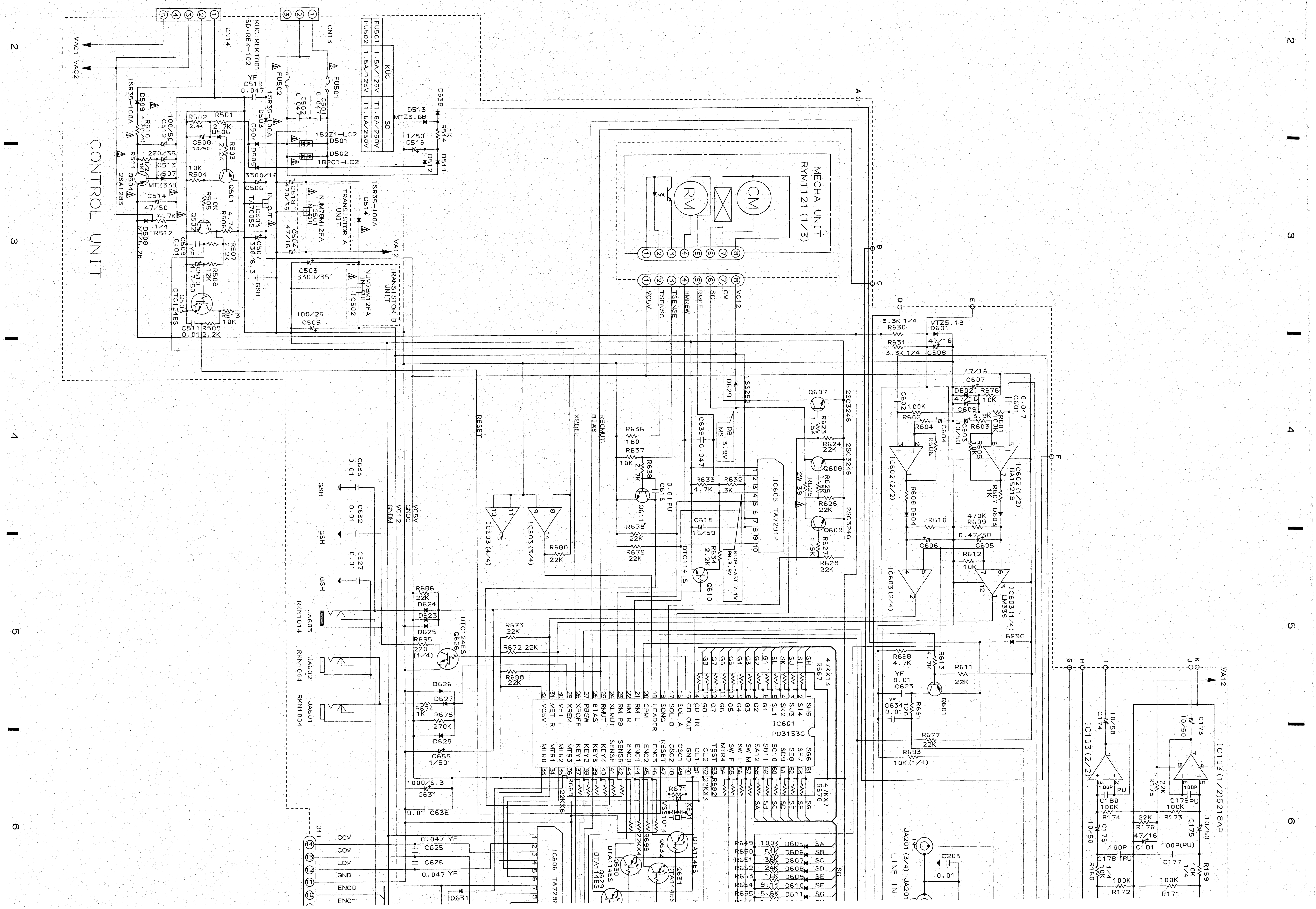
5. SWITCHES (Underline indicates switch position)

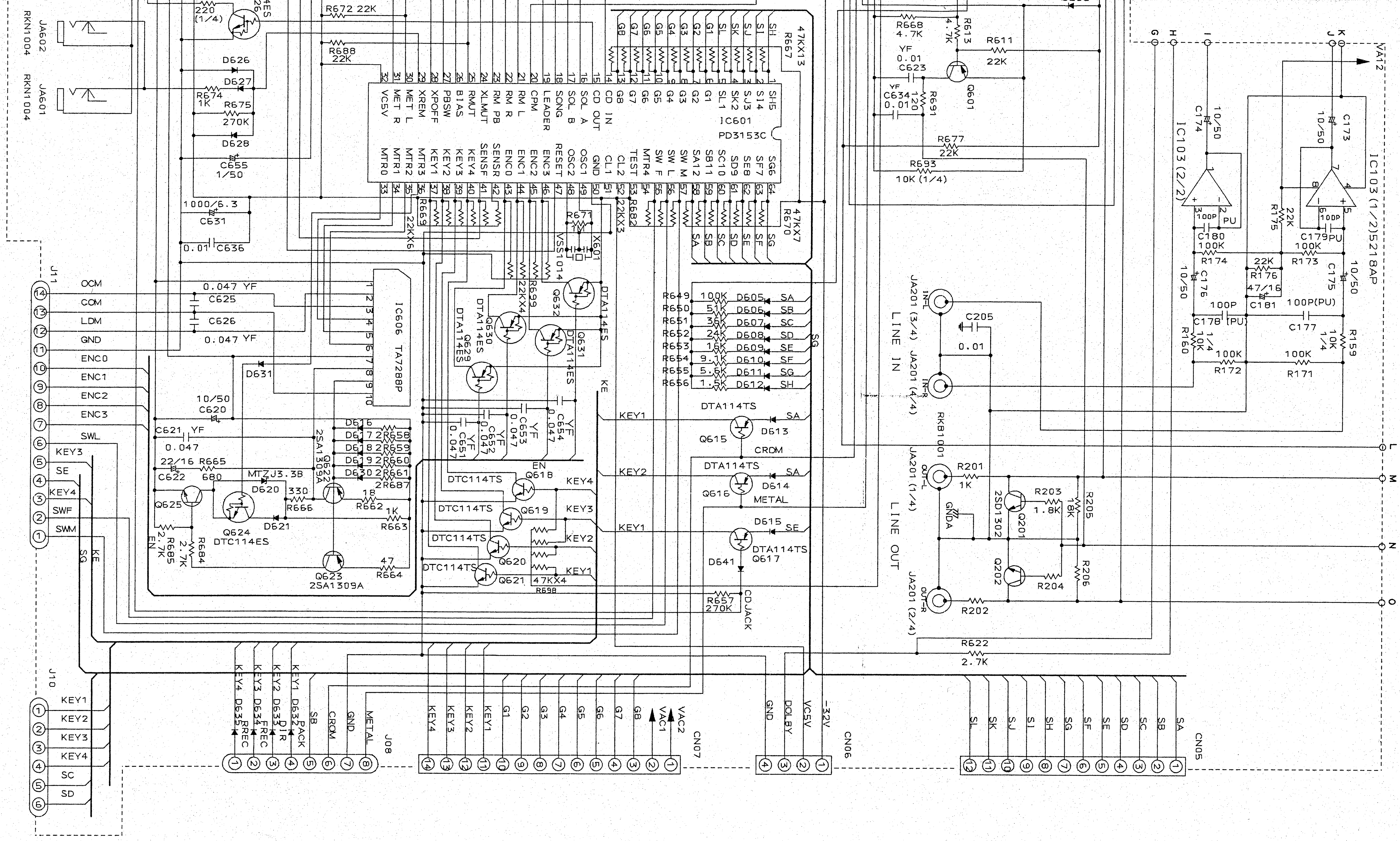
POWER UNIT

S1001 :	POWER	ON – OFF
S701 :	1	
S702 :	2	
S703 :	3	
S704 :	4	
S705 :	5	
S706 :	6	
S707 :	O/C	
S708 :	REW	
S709 :	REV	
S710 :	STOP	
S711 :	FWD	
S712 :	F. F	
S713 :	RETURN	
S714 :	REC	
S715 :	PAUSE	
S716 :	REC. MUTE	
S717 :	CD SYNC	
S718 :	C. MODE	
S719 :	C. RESET	
S720 :	RELAY	
S721 :	RANDOM	
S722 :	C. SCAN	
S723 :	ALL REW	
S724 :	TIMER	R. REC – REC – OFF – PLAY
S725 :	REVERSE	LOOP – 1WAY

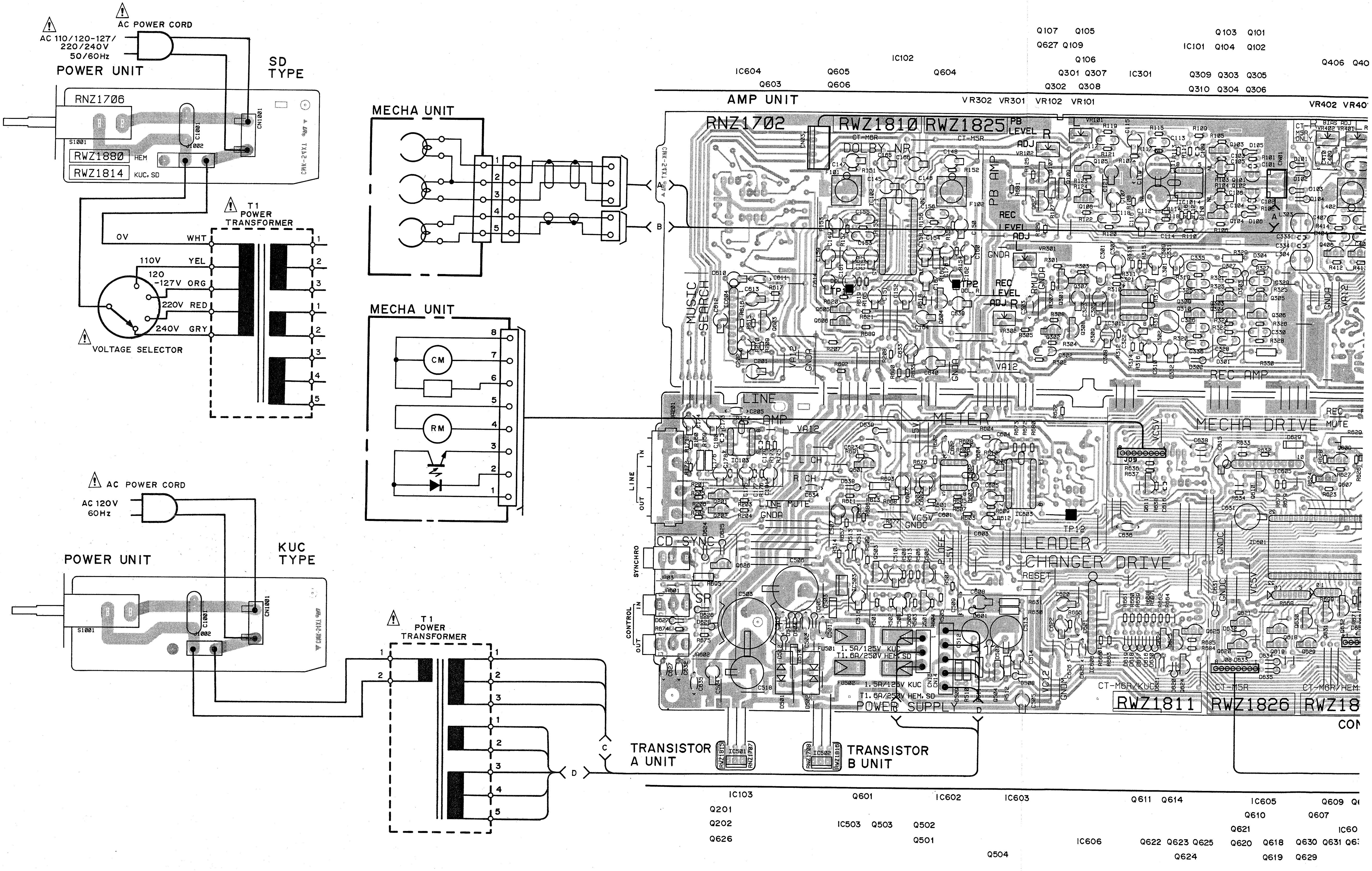

CONTROL UNIT
SUB UNIT J03 RWM1359 (2/2)
VR801 (2/2) 5K-A RCV1050
VR802 5K-B RCS1016 BALANCE VR
INPUT VR
VR801 (1/2)
L
R
R801 1.2K
R802 1.2K
IC604 BA335
Q603 DTC114TS
R615 180
R616 820
C610 0.1/50
C611 0.047
C612 0.47/50
R617 560K
C613 0.1/50
R692 1K
GNDA
CN03
C165 10/50
VA12
C166
-10.9dBV 285mV
R681 10K
Q604 DTC114TS
C639 1/50
R620 4.7K
R618 4.7K
Q605 DTC114TS
R621 22K
Q606
R689 39K
R635 1K
C640 33/16
C201 0.1/50
R209 8.2K
R210 C202
R207 7.5K
R208
J05
CN05
Sa Sb Sc Sd Se Sf Sg Sh Si Sj Sk Sl
J06
CN06
5V
DOLBY
DOLBY NR SW S725 RSH1007
R701 3K
B OFF C
R702 100K
R703 100K
J07
CN07
AC AC G8 G7 G6 G5 G4 G3 G2 G1 K1 K2 K3 K4
REVERSE MODE SW RSH1012 S726
LOOP 1WAY
TIMER SW S724 RSH1032
2 R.REC.
3 REC.
4 OFF
5 PLAY
D701 D702 D703 D704 D705 D706 D707 D708 D709 D710 D711 D712
S701 1
S702 2
S703 3
S704 4
S705 5
S706 6
S707 O/C
S708 REW
S709 REV.
S710 STOP
S711 FWD.
S712 F.F
S713 RETURN
S714 REC.
S715 PAUSE
S716 REC.MUTE
S717 CD SYNC
S718 C.MODE
S719 C.RESET
S720 RELAY
S721 RANDOM
S722 C.SCAN
S723 ALL REW
Q701 Q702 Q703 Q704
R712 120
R713 47K
R714 120
R715 47K
R716 120
R717 47K
R718 120
R719 47K
R704 100K
V701 RAW1068
F1 F1 8G Sq Sp 8G Sa 7G Sb 7G Sf 6G Sg Sc LEVEL Se 6G SG Sd Sj 5G DOLBY Sk 5G Sh 4G Si 3G Si 2G 2G HX PRO 1G 1G F2 F2
SUB UNIT (1/2)
J10
CN10
D1 D2 D3 D4 D5 D6
SW1 SW2 SW3 SW4 SW5 SW6
UPPER UNIT
J08
R. REC F. REC F/R PACK CrO2 METAL
MECHA UNIT (2/3)
SW-F SW11
SW-M SW12
D11
SW-R SW13
BOTTOM UNIT
NPN
2SC1740S
PNP
2SA933S
1SS254

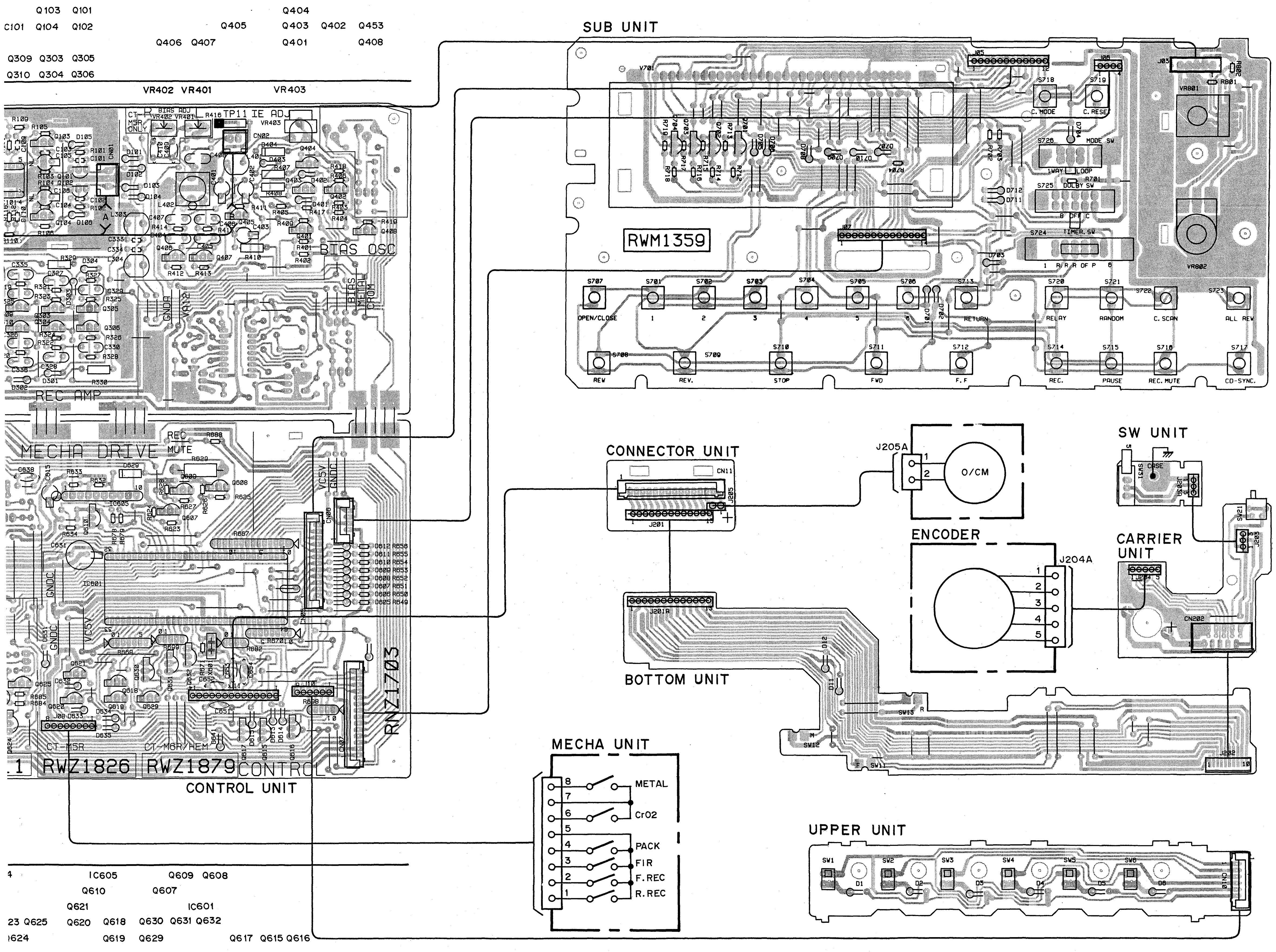
NOTE: If the parts are not identified in the the diagram, the followings are used.

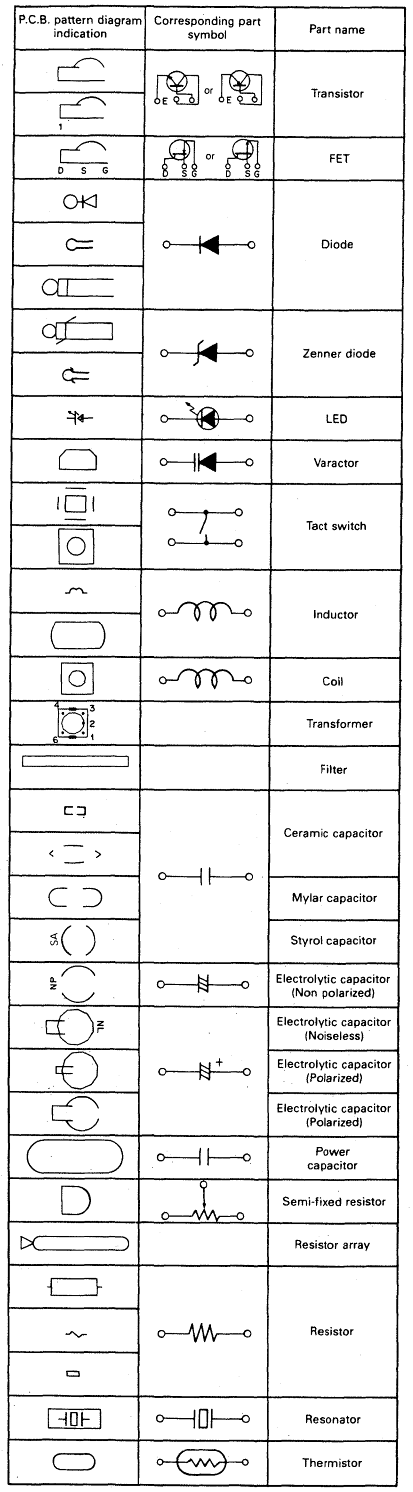

CONTROL UNIT
CN14
CN13
KUC:REK1001
SD:REK-102
KUC
SD
FU501 1.5A/125V T1.6A/250V
FU502 1.5A/125V T1.6A/250V
VAC1
VAC2
FU501
FU502
C501 0.047
C502 0.047
C519 0.047 YF
D513 MTZ3.6B
D638
R514 1K
C516 1/50
D511
D512
D501 1B2Z1-LC2
D502 1B2C1-LC2
D503 1SR35-100A
D504
D505
D509 1SR35-100A
R510 4.7(1/4)
C512 100/50
R511 1K(1/2)
Q504 2SA1283
C513 220/35
D507 MTZ33B
C514 47/50
R512 4.7K 1/4
D508 MTZ6.2B
R502 2.4K
R501 2.7K
D506
C508 10/50
R503 2.2K
R504 10K
Q501
R505 10K
Q502
R506 4.7K
R507 2.2K
C509 0.01
YF
C510 4.7/50
R508 12K
Q503 DTC124ES
R513 10K
C511 0.01
R509 2.2K
C506 3300/16
IC503 TA7805S
C507 330/6.3
C518 470/35
IC501 NJM78M12FA
C504 47/16
TRANSISTOR A UNIT
D514 1SR35-100A
VA12
C503 3300/35
IC502 NJM78M12FA
TRANSISTOR B UNIT
C505 100/25
GSH
MECHA UNIT RYM1121 (1/3)
CM
RM
VC5V
TSENSC
TSENSE
RMREW
RMFF
SOL
CM
VC12
A
B
C
D
E
F
G
H
I
J
K
R630 3.3K 1/4
R631 3.3K 1/4
D601 MTZ5.1B
C608 47/16
C607 47/16
D602
R676 10K
C601 0.047
C602
R602 100K
C609 47/16
R601 100K
R603 9K
R604
C604
C603 10/50
R606
R605 10K
IC602 (2/2)
IC602 (1/2) BA15218
R608
D604
R607 1K
D603
R610
R609 470K
C606
C605 0.47/50
R612 10K
IC603 (2/4)
IC603 (1/4) LM339
D639
D629 1SS252
Q607 2SC3246
R623 1.5K
R624 22K
Q608 2SC3246
R625 1.5K
R629 2W 39
R626 22K
Q609 2SC3246
R627 1.5K
R628 22K
C638 0.047
PB MS: 3.9V
IC605 TA7291P
R633 4.7K
R632 3K
C615 10/50
R634 2.2K
STOP, FAST: 7.1V PB: 3.9V
Q610 DTC114TS
R636 180
R637 10K
R638 2.7K
C616 0.01 PU
Q611
R678 22K
R679 22K
RECMUT
BIAS
XPOFF
RESET
IC603 (4/4)
IC603 (3/4)
R680 22K
VC5V
GNDC
VC12
GNDM
C635 0.01
C632 0.01
C627 0.01
GSH
JA603 RKN1014
JA602 RKN1004
JA601 RKN1004
R686 22K
D624
D623
D625
R695 220 (1/4)
Q626 DTC124ES
D626
D627
R674 1K
R675 270K
D628
C655 1/50
C631 1000/6.3
C636 0.01
R673 22K
R672 22K
R688 22K
IC601 PD3153C
R667 47KX13
R670 47KX7
R682 22KX3
R669 22KX6
R671
X601
VSS1014
R699 22KX4
Q632 DTA114ES
Q631 DTA114ES
Q630 DTA114ES
Q629 DTA114ES
IC606 TA7288
J11
OCM
COM
LDM
GND
ENC0
ENC1
C625 0.047 YF
C626 0.047 YF
D631
R649 100K
R650 51K
R651 33K
R652 24K
R653 16K
R654 9.1K
R655 5.6K
D605 SA
D606 SB
D607 SC
D608 SD
D609 SE
D610 SF
D611 SG
SG
R668 4.7K
R613 4.7K
R611 22K
C623 0.01 YF
Q601
C634 0.01 YF
R691 120
R677 22K
R693 10K (1/4)
JA201 (3/4)
LINE IN
INPUT
C205 0.01
IC103 (2/2)
IC103 (1/2) 5218AP
C174 10/50
C173 10/50
C180 3P 100P
C179 100P PU
R174 100K
R173 100K
R175 22K
R176 22K
C181 47/16
C176 10/50
C175 10/50
C178 100P (PU)
C177 100P (PU)
R160 1/4 10K
R159 10K 1/4
R172 100K
R171 100K
VA12
2
3
4
5
6


IC601
PD3153C
IC606 TA7288P
IC103 (1/2)5218AP
IC103 (2/2)
JA602 RKN1004
JA601 RKN1004
J11
OCM
COM
LDM
GND
ENC0
ENC1
ENC2
ENC3
SWL
KEY3
SE
KEY4
SWF
SWM
J10
KEY1
KEY2
KEY3
KEY4
SC
SD
J08
KEY4 D635 REC
KEY3 D634 FREC
KEY2 D633 DIR
KEY1 D632 PACK
SB
CROM
GND
METAL
CN07
KEY4
KEY3
KEY2
KEY1
G1
G2
G3
G4
G5
G6
G7
G8
VAC1
VAC2
CN06
GND
DOLBY
VC5V
-32V
CN05
SL
SK
SJ
SI
SH
SG
SF
SE
SD
SC
SB
SA
R672 22K
R688 22K
220 (1/4)
D626
D627
R674 1K
R675 270K
D628
C655 1/50
1000/6.3 C631
0.01 C636
0.047 YF C625
C626 0.047 YF
D631
10/50 C620
C621 YF 0.047
22/16 R665 680
C622
MTZJ3.3B
D620
330 R666
D621
Q625
Q624 DTC114ES
R685 2.7K
R684 2.7K
EN
Q622 2SA1309A
Q623 2SA1309A
R662 18
R663 1K
R664 47
D616 D617 D618 D619 D630
R658 R659 R660 R661 R687
22KX6
R669
R671
X601
VSS1014
22KX3
R682
47KX7
R670
47KX13
R667
R699
22KX4
Q630 DTA114ES
Q629 DTA114ES
Q631 DTA114ES
Q632 DTA114ES
C651 YF 0.047
C652 YF 0.047
C653 YF 0.047
C654 YF 0.047
KE
SG
DTC114TS Q618
DTC114TS Q619
DTC114TS Q620
DTC114TS Q621
47KX4
R698
R649 100K D605 SA
R650 51K D606 SB
R651 36K D607 SC
R652 24K D608 SD
R653 16K D609 SE
R654 9.1K D610 SF
R655 5.6K D611 SG
R656 1.1K D612 SH
DTA114TS Q615 D613 SA CROM
DTA114TS Q616 D614 SA METAL
D615 SE DTA114TS Q617
D641
R657 270K
CDJACK
R668 4.7K
R613 4.7K
R611 22K
YF 0.01 C623
YF C634 0.01
R691 12K
Q601
R677 22K
R693 10K (1/4)
JA201 (3/4) IN-L
JA201 (4/4) IN-R
LINE IN
C205 0.01
RKB1001
JA201 (1/4) OUT-L
JA201 (2/4) OUT-R
LINE OUT
R201 1K
R202
GNDA
2SD1302 Q201
Q202
R203 1.8K
R204
R205 18K
R206
R622 2.7K
C174 10/50
C173 10/50
100P C180
100K R174
R175 22K
C179 PU
100K R173
C175 10/50
C176 10/50
22K R176
47/16 C181
100P C178 PU
100P(PU) C177
R160 10K 1/4
R159 10K 1/4
100K R172
100K R171
VA12
G H I J K
L M N O
B C D E F
6 7 8 9

3. P.C. BOARDS CONNECTION DIAGRAM


AC POWER CORD
AC 110/120-127/220/240V 50/60Hz
POWER UNIT
SD TYPE
RNZ1706
RWZ1880 HEM
RWZ1814 KUC, SD
S1001
C1001
CN1001
T1 POWER TRANSFORMER
0V WHT
110V YEL
120-127V ORG
220V RED
240V GRY
VOLTAGE SELECTOR
MECHA UNIT
CM
RM
AC POWER CORD
AC 120V 60Hz
POWER UNIT
KUC TYPE
T1 POWER TRANSFORMER
AMP UNIT
RNZ1702
RWZ1810
RWZ1825
CT-M6R
CT-M5R
DOLBY NR
PB LEVEL ADJ
PB AMP
REC LEVEL ADJ
MUSIC SEARCH
LINE AMP
METER
REC AMP
MECHA DRIVE
REC MUTE
LINE MUTE
CD SYNC
SR
LEADER
CHANGER DRIVE
RESET
POWER SUPPLY
1.5A/125V KUC
T1.6A/250V HEM, SD
CT-M6R/KUC
RWZ1811
RWZ1826
CT-M6R/HEM
TRANSISTOR A UNIT
TRANSISTOR B UNIT
IC501
IC502
TP1
TP2
TP12
LINE IN
LINE OUT
SYNCHRO
CONTROL IN
CONTROL OUT
A
B
C
D
IC604 Q603 Q605 Q606 IC102 Q604
Q107 Q105 Q627 Q109 Q106 Q301 Q307 Q302 Q308 IC301
IC101 Q103 Q101 Q104 Q102 Q309 Q303 Q305 Q310 Q304 Q306 Q406
VR302 VR301 VR102 VR101 VR402
IC103 Q201 Q202 Q626 Q601 IC503 Q503 Q502 Q501 IC602 IC603 Q504 IC606
Q611 Q614 Q622 Q623 Q625 Q624 IC605 Q610 Q621 Q620 Q618 Q619 Q609 Q607 Q630 Q631 Q629

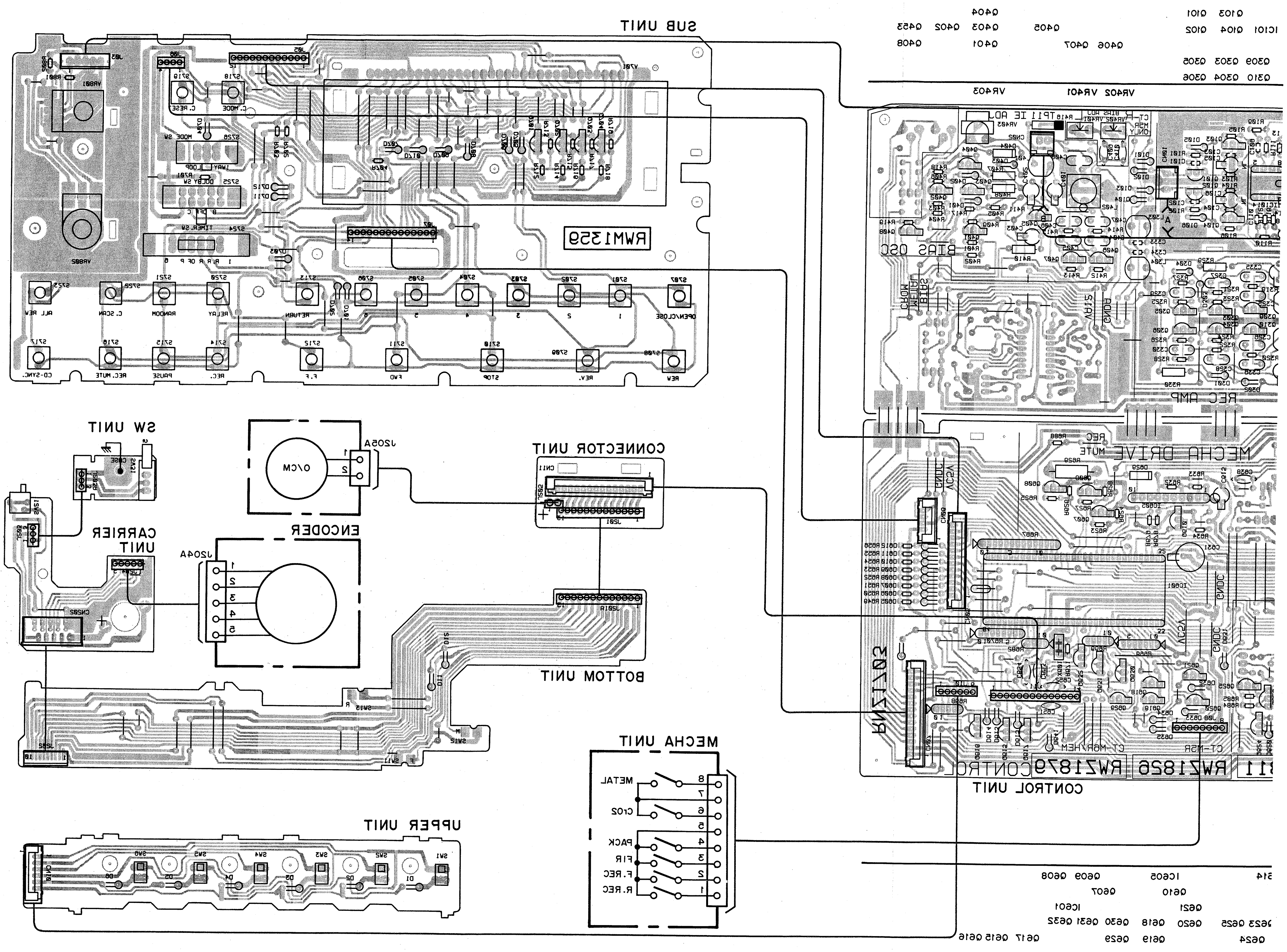

SUB UNIT
RWM1359
OPEN/CLOSE
RETURN
RELAY
RANDOM
C. SCAN
ALL REW
REW
REV.
STOP
FWD
F. F
REC.
PAUSE
REC. MUTE
CD-SYNC.
C. MODE
C. RESET
MODE SW
DOLBY SW
TIMER SW
1WAY LOOP
CONNECTOR UNIT
CN11
J201
J205
BOTTOM UNIT
J201R
J202
J205A
O/CM
ENCODER
J204A
SW UNIT
CARRIER UNIT
CN208
MECHA UNIT
METAL
CrO2
PACK
FIR
F.REC
R.REC
UPPER UNIT
CN10
SW1
SW2
SW3
SW4
SW5
SW6
D1
D2
D3
D4
D5
D6
CONTROL UNIT
RWZ1826
RWZ1879
RNZ1703
CT-M5R
CT-M6R/HEM
REC AMP
MECHA DRIVE
BIAS OSC
TP11 IE ADJ
BIAS ADJ
VR402 VR401
VR403
Q103 Q101
C101 Q104 Q102
Q309 Q303 Q305
Q310 Q304 Q306
Q404
Q405
Q403 Q402 Q453
Q406 Q407
Q401
Q408
IC605
Q609 Q608
Q610
Q607
Q621
IC601
Q625
Q620 Q618 Q630 Q631 Q632
Q624
Q619 Q629
Q617 Q615 Q616



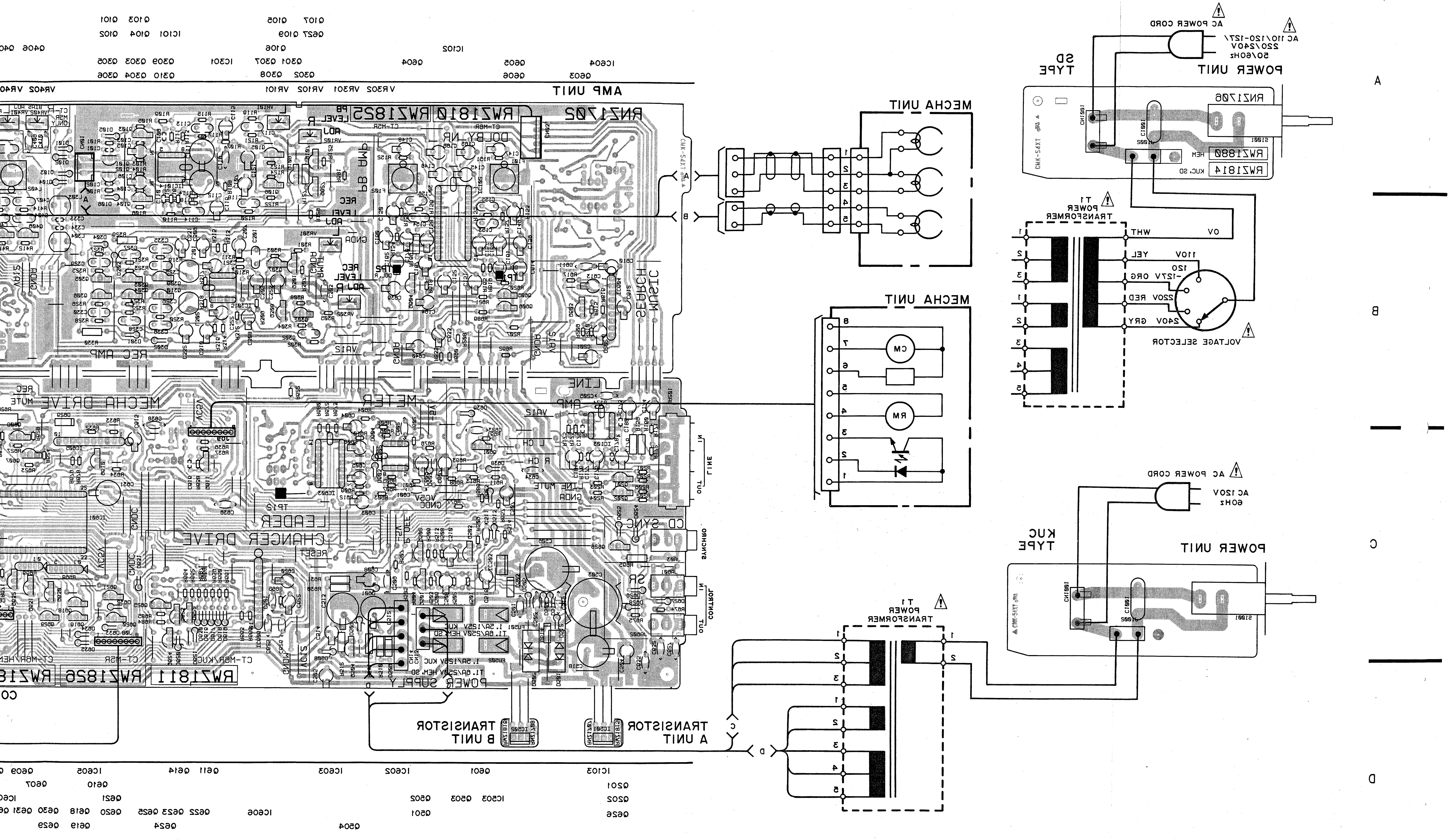
P.C.B. pattern diagram indication	Corresponding part symbol	Part name
		Transistor
		FET
		Diode
		Zenner diode
		LED
		Varactor
		Tact switch
		Inductor
		Coil
		Transformer
		Filter
		Ceramic capacitor
		Mylar capacitor
		Styrol capacitor
		Electrolytic capacitor (Non polarized)
		Electrolytic capacitor (Noiseless)
		Electrolytic capacitor (Polarized)
		Electrolytic capacitor (Polarized)
		Power capacitor
		Semi-fixed resistor
		Resistor array
		Resistor
		Resonator
		Thermistor

1. This P.C.B. connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the above Table.
3. The capacitor terminal marked with ▭ shows negative terminal.
4. The diode marked with ○ shows cathode side.
5. The transistor terminal marked with ▭ shows emitter.

This P.C.B. connection diagram is viewed from the foil side.


SUB UNIT
RWM1359
SW UNIT
ENCODER
J205A
O/CM
CONNECTOR UNIT
CARRIER UNIT
J204A
BOTTOM UNIT
MECHA UNIT
METAL
CrO2
PACK
FIR
F.REC
R.REC
UPPER UNIT
CONTROL UNIT
RWZ1879
RWZ1826
BIAS OSC
REC AMP
MECHA DRIVE
OPEN/CLOSE
STOP
FWD
REV.
REW
F.F
REC.
PAUSE
REC.MUTE
CD-SYNC.
ALL REW
C.SCAN
RANDOM
RELAY
RETURN
C.MODE
C.RESE
MODE SW
DOLBY SW
TIMER SW
A
B
C
D
6
7
8
9
10
11
12

3. P.C. BOARDS CONNECTION DIAGRAM


AC POWER CORD
AC 110/120-127/220/240V 50/60Hz
POWER UNIT
SD TYPE
RNZ1706
RWZ1880 HEM
RWZ1814 KUC, SD
T1 POWER TRANSFORMER
WHT 0V
YEL 110V
ORG 120-127V
RED 220V
GRY 240V
VOLTAGE SELECTOR
MECHA UNIT
AMP UNIT
RNZ1702
RWZ1810
RWZ1825
PB LEVEL
DOLBY NR
REC LEVEL
REC AMP
PB AMP
MUSIC SEARCH
MECHA DRIVE
METER
LINE AMP
LINE IN
LINE OUT
CD SYNC
SYNCHRO
SR
CONTROL IN
CONTROL OUT
CHANGER DRIVE
LEADER
RESET
POWER SUPPLY
RWZ1811
RWZ1826
CT-M6R/KUC
CT-M5R
AC POWER CORD
AC 120V 60Hz
KUC TYPE
POWER UNIT
T1 POWER TRANSFORMER
TRANSISTOR A UNIT
TRANSISTOR B UNIT
CM
RM
A
B
C
D

4. ADJUSTMENTS

RECORDING SECTION

With the exception of this procedure, the adjustment is the same as for CT-M6R (ARP1890).

3. Recording Bias Adjustment

- After the adjustment, caution should be exercised so as not to become under bias by checking the distortion rate.

No.	Mode	Input signal & test tape	Adjustment location		Measuring location	Adjustment value	Remarks
1.	STOP	Set the TAPE SELECTOR switch to the NORM position.					
2.	REC	Record the 315 Hz and 6.3 kHz signals at −20 dBv input level and playback.	Deck I	VR401 (Lch) VR402 (Rch)	LINE OUT	Repeatedly record, playback and adjust so that the playback level of 6.3 kHz signal becomes +1.0 dB±0.5 dB when compared with the 315 Hz signal.	

4. RÉGLAGE

SECTION D'ENREGISTREMENT

A l'exception de cette procédure, le réglage est le méme que pour le CT-M6R (ARP1890).

3. Réglage de la polarisation d'enregistrement

- Après le réglage, des précautions doivent être prises pour éviter une sous-polarisation en vérifiant le taux de distorsion.

No.	Mode	Signal d'entrée et bande d'essai	Points de réglage		Points de mesure	Valeur de réglage	Remarques
1.	STOP	Régler le sélecteur de bande (TAPE SELECTOR) sur la position NORM.					
2.	REC	Enregistrer les signaux 315 Hz et 6,3 kHz à un niveau d'entrée de −20 dBv et les reproduire.	Platine I	VR401 (can. G) VR402 (can. D)	Sortie de ligne (LINE OUT)	Enregistrer, reproduire et régler de manière répétée de sorte que le niveau de lecture du signal 6,3 kHz devienne +1,0 dB ±0,5 dB lorsqu'il est comparé avec le signal 315 Hz.	

4. AJUSTE

SECCIÓN DE GRABACIÓN

Salvo este procedimiento, el ajuste es igual que para el CT-M6R (ARP1890).

3. Ajuste de polarización de grabación

- Una vez finalizado el ajuste, compruebe el porcentaje de distorsión para no obtener subpolarización.

N.°	Modo	Señal de entrada y cinta de prueba	Punto de ajuste		Punto de medición	Valor de ajuste	Comentarios
1.	STOP	Ponga el conmutador TAPE SELECTOR en la posición NORM.					
2.	REC	Grabe la señal de 315 Hz y 6,3 kHz a un nivel de entrada de −20 dBv y reprodúzcala.	Platina I	VR 401 (Lch) VR 402 (Rch)	LINE OUT	Grabe, reproduzca y ajuste repetidamente para que el nivel de la señal de reproducción de 6,3 kHz sea de + 1,0 dB ± 0,5 dB cuando se compare con la señal de 315 Hz.	

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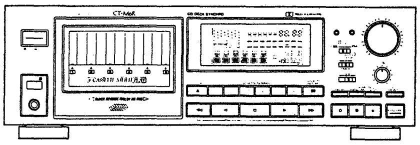
The future of sound and vision.

Service Manual



ORDER NO.
ARP1890

MULTI-CASSETTE CHANGER

CT-M6R

● This manual is applicable to the KUC type.

CONTENTS

1. SAFETY INFORMATION ··· 2
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PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS SERVICE INC. P.O. Box 1760, Long Beach, California 90801 U.S.A.
PIONEER ELECTRONICS OF CANADA, INC. 505 Cochrane Drive, Markham, Ontario L3R 8E3 Canada
PIONEER ELECTRONIC [EUROPE] N.V. Keetberglaan 1, 2740 Beveren, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia TEL: [03] 580-9911

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SI JAN. 1990 Printed in Japan

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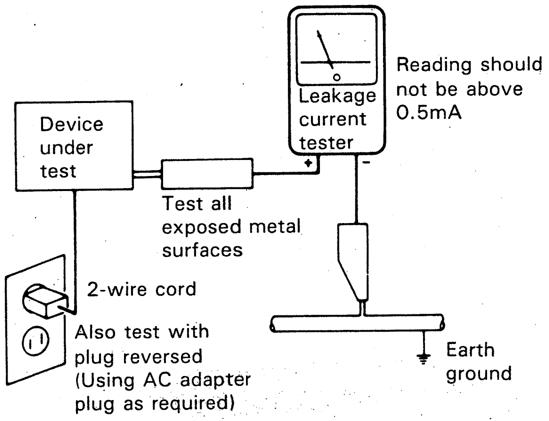
1. SAFETY INFORMATION

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.


Reading should not be above 0.5mA
Leakage current tester
Device under test
+
-
Test all exposed metal surfaces
2-wire cord
Also test with plug reversed (Using AC adapter plug as required)
Earth ground

AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

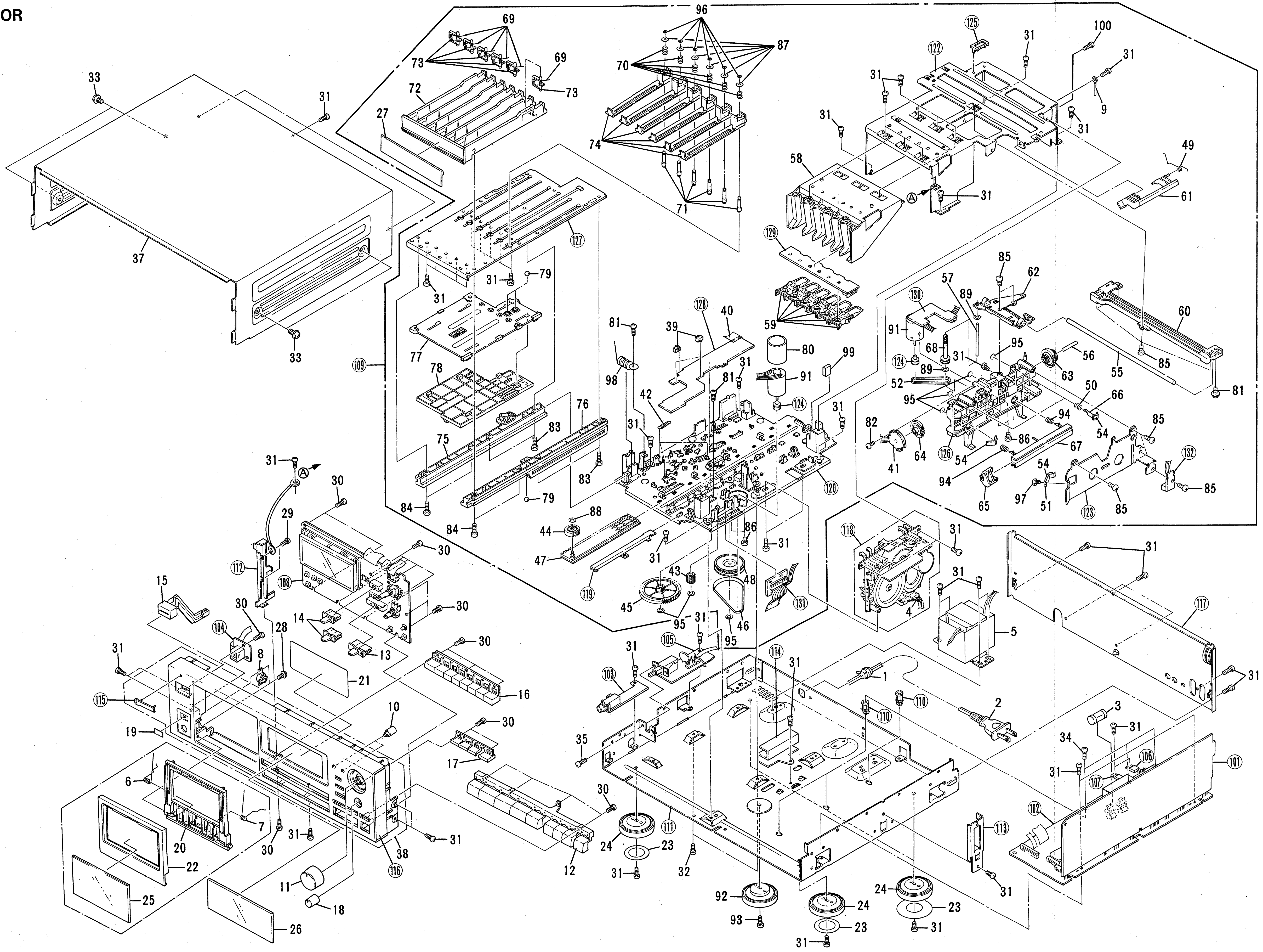
Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which dose not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

2. EXPLODED VIEWS AND PARTS LIST

2.1 EXTERIOR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- Part
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- Part

Part

Marl

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⚠

NOTES :
- Parts without part number cannot be supplied.
- The ⚠ mark found on some component parts indicates the impotance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

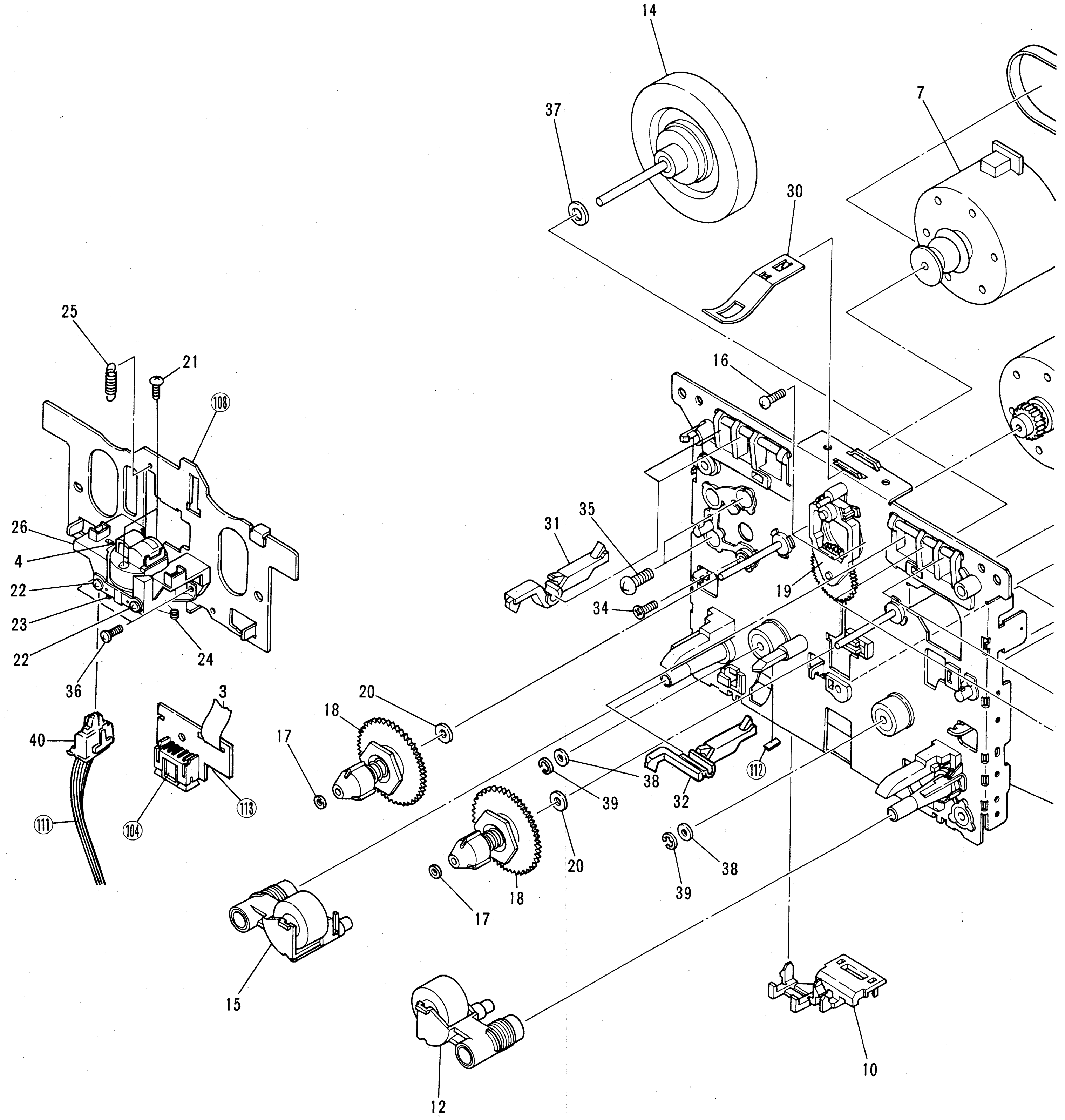
Parts List of Exterior

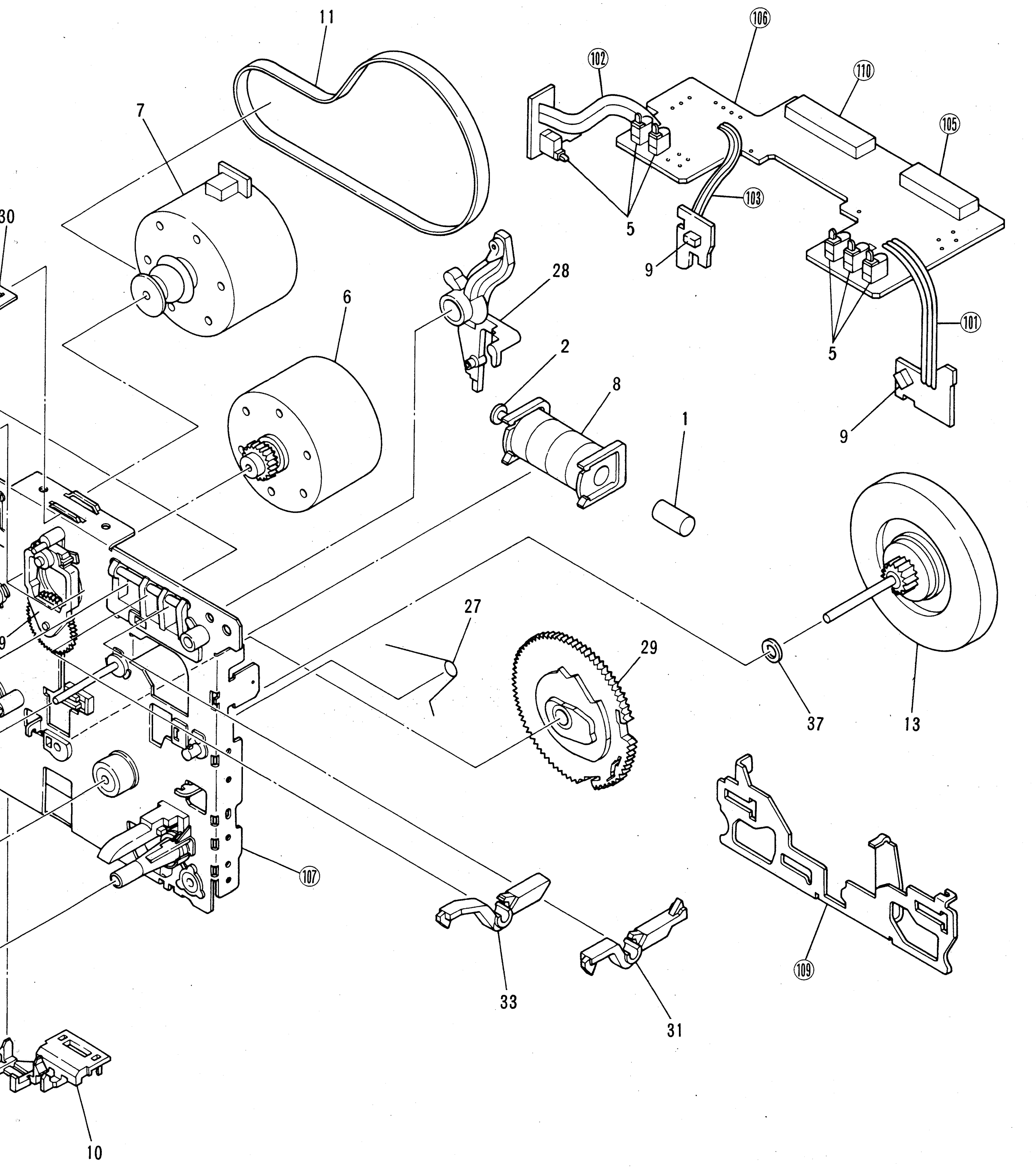
Mark	No.	Part No.	Description
⚠	1	CM−22C	Strain relief
⚠	2	PDG1015	Power cord
⚠	3	REK1001	FU501, FU502 Fuse (1.5A)
	4	RKP1350	Connector assembly 5P
⚠	5	RTT1115	T1 Power transformer
	6	RBH1241	Door spring (L)
	7	RBH1242	Door spring (R)
	8	REC1005	Damper assembly
	9	RNH−184	Cord clamper
	10	RAA1014	Counter reset button
	11	RAC1363	VR knob
	12	RAC1456	Operation button
	13	RAC1457	Slide knob (A)
	14	RAC1458	Slide knob
	15	RAC1459	Power button
	16	RAC1460	Tact button (A)
	17	RAC1461	Tact button (B)
	18	RAC1462	VR knob (B)
	19	RAH1571	Remote control panel
	20	RNK1544	Door
	21	RNK1545	FL filter
	22	RNK1547	Door cover
	23	VEC1061	Stopper
	24	VNK1095	Insulator
	25	RAH1569	Door lens
	26	RAH1570	FL lens
	27	RNK1548	Tray plate
	28	ARZ26P060FMC	Screw
	29	BBZ26P060FMC	Screw
	30	BBZ26P080FZK	Screw
	31	BBZ30P080FMC	Screw
	32	BBZ30P120FMC	Screw
	33	FBT40P080FZK	Screw
	34	IBZ30P150FCU	Screw
	35	PMA30P060FMC	Screw
	36	REC−371	Binder
	37	RXX1250	Bonnet
	38	RXX1251	Front panel assembly
	39	PSH1003	Slide switch
	40	RDD1185	Lead card 10p
	41	RXA1323	Encoder assembly
	42	RBH1243	Switch spring
	43	RNK1551	Drive gear (A)
	44	RNK1552	Drive gear (B)
	45	RNK1553	Interval gear
	46	REB1127	O/C belt
	47	RNK1606	Rack plate
	48	RNK1604	Pulley gear
	49	RBH1244	Reset lever spring
	50	RBH1247	Cassette pressure spring
	51	RBK1033	Cassette hold spring
	52	REB1120	Drive belt
	53	RED1024	Carrier felt
	54	RED1025	Pressure felt
	55	RLA1137	Guide shaft
	56	RLA1140	Loading shaft
	57	RLA1141	Worm shaft
	58	RNK1558	Upper holder
	59	RNK1560	Cassette arm
	60	RNK1561	Upper rack
	61	RNK1562	Reset lever
	62	RNK1573	Carrier slider
	63	RNK1576	Loading gear
	64	RNK1577	Encoder gear
	65	RNK1578	Selector
	66	RNK1579	Cassette pressure (A)
	67	RNK1580	Cassette pressure (B)
	68	RXA1319	Worm pulley assembly
	69	RBH1245	Stopper arm spring
	70	RBH1246	Stopper pin spring
	71	RLA1138	Stopper pin
	72	RNK1564	Tray
	73	RNK1565	Stopper arm
	74	RNK1567	Cassette holder
	75	RNK1568	Side rail (L)
	76	RNK1569	Side rail (R)
	77	RNK1570	Drive plate (A)
	78	RNK1571	Drive plate (B)
	79	PBP−007	Steel ball ϕ 5
	80	RNE1373	Shield band
	81	ABZ30P080FMC	Screw
	82	BPZ20Y060FMC	Screw
	83	BBZ26P100FMC	Screw
	84	BBZ26P140FZK	Screw
	85	BBZ30P060FZK	Screw
	86	PMZ30P040FMC	Screw
	87	WA21D085D025	Washer
	88	WT21D050D050	Washer
	89	WA26D047D050	Washer
	90		......
	91	RXX1253	Motor assembly
	92	PNW1376	Insulator
	93	BBZ30P100FMC	Screw
	94	RBH1256	Cassette pressure spring 2
	95	WT26D047D050	Washer
	96	WT17D034D050	Washer
	97	BBZ20P040FMC	Screw
	98	RBH1261	Earth spring
	99	REB1129	Tray stopper
	100	ABZ30P150FMC	Screw
	101		Amp unit
	102		Control unit
	103		HP. jack unit
	104		Remo−con unit
	105		Power switch unit
	106		Transistor A unit
	107		Transistor B unit
	108		Sub unit
	109		Loading unit
	110		PCB spacer
	111		Main chassis
	112		Door holder
	113		PCB holder
	114		Shield plate (A)
	115		Name plate
	116		Front panel
	117		Rear panel
	118		Mechanism unit
	119		Load plate
	120		Bottom chassis
	121		......
	122		Upper chassis
	123		Carrier plate
	124		Motor pulley
	125		Lead holder
	126		Carrier assembly
	127		Tray base
	128		Bottom unit
	129		Upper unit
	130		Carrier unit
	131		Connector unit
	132		Switch unit

Parts List of Mechanism Unit

Mark	No.	Part No.	Description
	1	RLA1130	Shaft
	2	RLA1132	Planger
	3	RNP1232	HD FPC (R/P)
	4	RPB1030	R/P, E head
	5	RSG1018	Push switch
	6	RXM1029	Motor assembly
	7	RXM1032	Motor assembly (Main)
	8	RXP1010	Solenoid
	9	SPI-335-34-C	Photo transistor
	10	RNK1530	Wire holder
	11	REB1112	Main belt
	12	RXA1183	Pinch roller assembly
	13	RXA1294	Flywheel assembly
	14	RXA1295	Flywheel assembly
	15	RXA1296	Pinch roller (L) assembly
	16	RBA1076	Screw
	17	RBF-057	Washer
	18	RXA1184	TU Reel assembly
	19	RXA1248	Idler assembly
	20	WA21D070D013	Washer
	21	PMZ14P050FNI	Screw
	22	RBA1080	Azimuth screw
	23	RBK1029	Azimuth spring
	24	RBL-085	Rotation spring
	25	RBL1003	Head base spring
	26	RXA1293	Head housing assembly
	27	RBH1239	Slide spring
	28	RNK1525	Play arm
	29	RNK1526	Cam gear
	30	RBK1031	Cassette hold spring
	31	RNK1527	REC detection lever
	32	RNK1537	Metal detection lever (R)
	33	RNK1543	Pack detection lever (P)
	34	PBZ30P080FMC	Screw
	35	PMZ26P050FMC	Screw
	36	RBA1077	Screw
	37	WA26D045D025	Washer
	38	WA26D047D050	Washer
	39	YE15FUC	Washer
	40	SPI-320-AB	Quick sensor
	101		Triple-conductor jumper wire
	102		Dual-conductor jumper wire
	103		Jumper wire
	104		Connector (5P)
	105		Connector (8P)
	106		P.C. board
	107		Chassis assembly
	108		Head base
	109		Slide plate
	110		Connector (12P)
	111		QS jumper wire
	112		Reflection plate
	113		Head P.C.B R/P

2.2 MECHANISM UNIT

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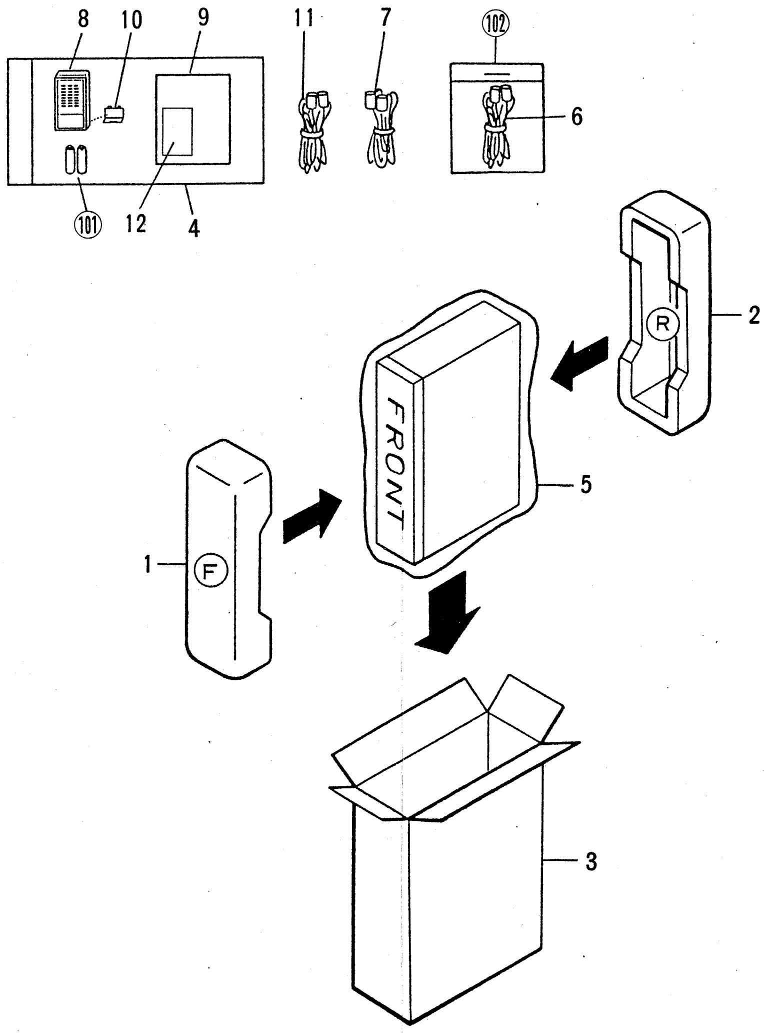
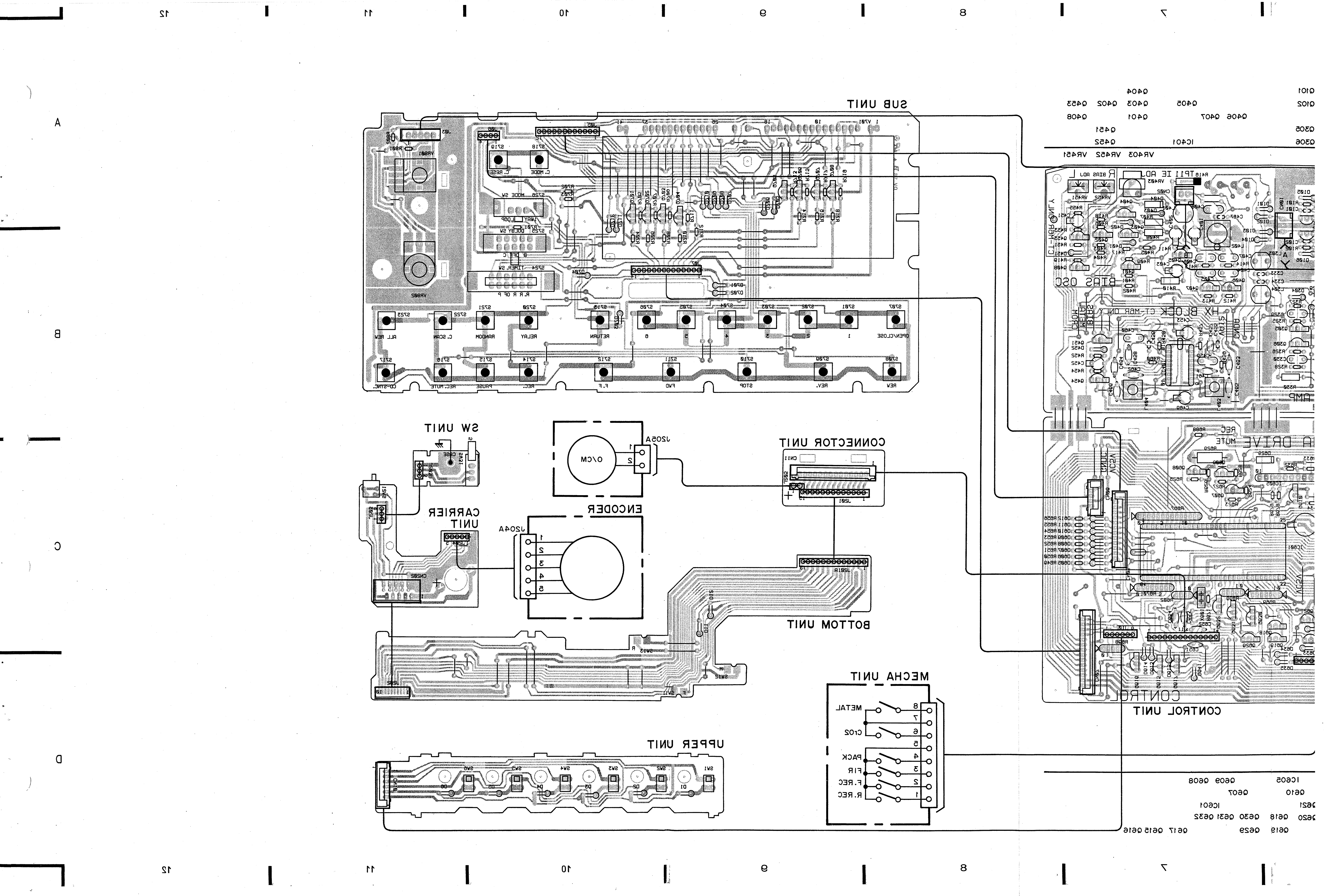
106
102
110
105
7
30
5
103
28
9
6
2
8
1
5
101
9
27
29
37
13
107
33
31
109
10

3. PACKING

Parts List

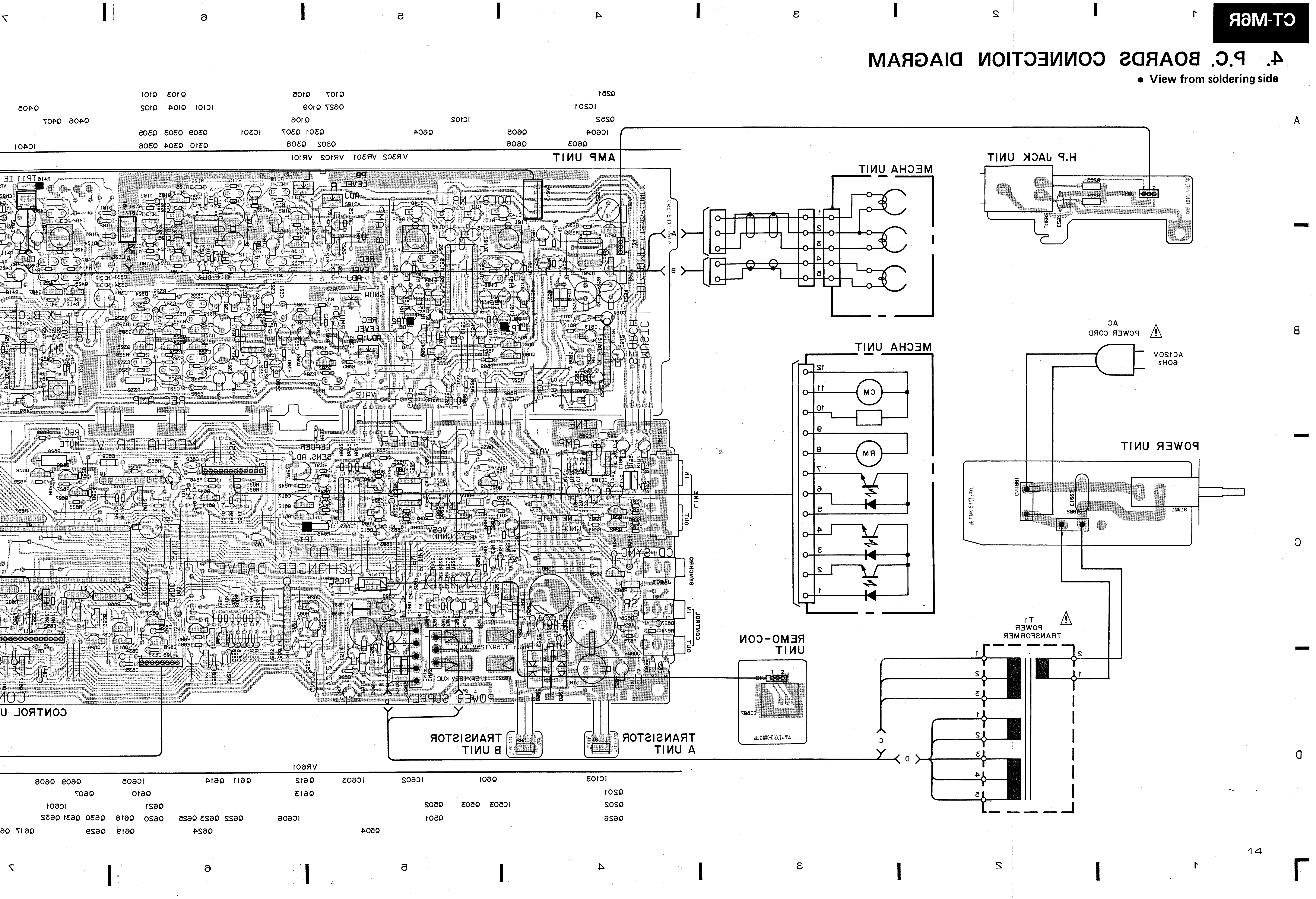
Mark	No.	Part No.	Description
	1	RHA1044	Pad (F)
	2	RHA1045	Pad (R)
	3	RHG1152	Packing case
	4	RHL1001	Plustic bag
	5	RHX−034	Sheet
	6	PDE−319	Connection cord (Mini−plug)
	7	RDE1018	Control cord
	8	RPX1035	Remote control unit
	9	RRB1054	Operating instructions (English)
	10	VNK−634	Case (C)
	11	RDE−010	Connection cord
	12	RRW1065	Title seal
	101		Battery
	102		Connection cord assembly


8
10
9
11
7
102
6
101
12
4
2
R
FRONT
5
1
F
3


12
11
10
9
8
7
A
B
C
D
SUB UNIT
C.RESET
C.MODE
MODE SW
DOLBY SW
TIMER SW
OPEN/CLOSE
1
2
3
4
5
6
RETURN
RELAY
RANDOM
C.SCAN
ALL REW
REW
REV.
STOP
FWD
F.F
REC.
PAUSE
REC.MUTE
CO-SYNC.
SW UNIT
CARRIER UNIT
ENCODER
CONNECTOR UNIT
BOTTOM UNIT
MECHA UNIT
METAL
CrO2
PACK
FIR
F.REC
R.REC
UPPER UNIT
CONTROL UNIT
HX BLOCK CT-M6R ONLY
BIAS OSC
Q101 Q102 Q305 Q306
Q404 Q405 Q403 Q402 Q453
Q406 Q407 Q401 Q408
Q451 Q452 IC401
VR403 VR452 VR451
IC605 Q609 Q608
Q610 Q607
IC601
Q618 Q630 Q631 Q632
Q619 Q629
Q617 Q615 Q616
Q620 Q621

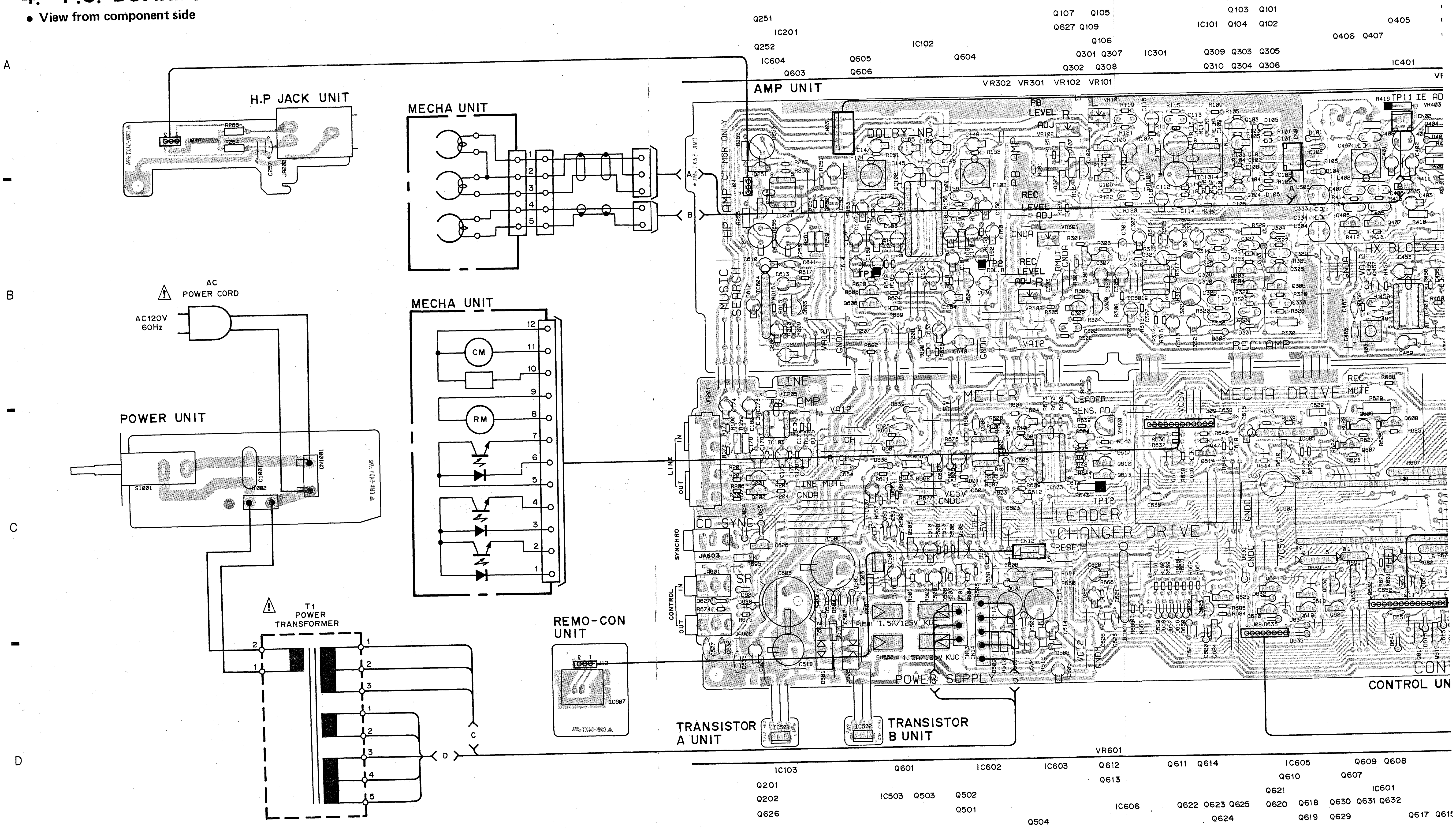
4. P.C. BOARDS CONNECTION DIAGRAM

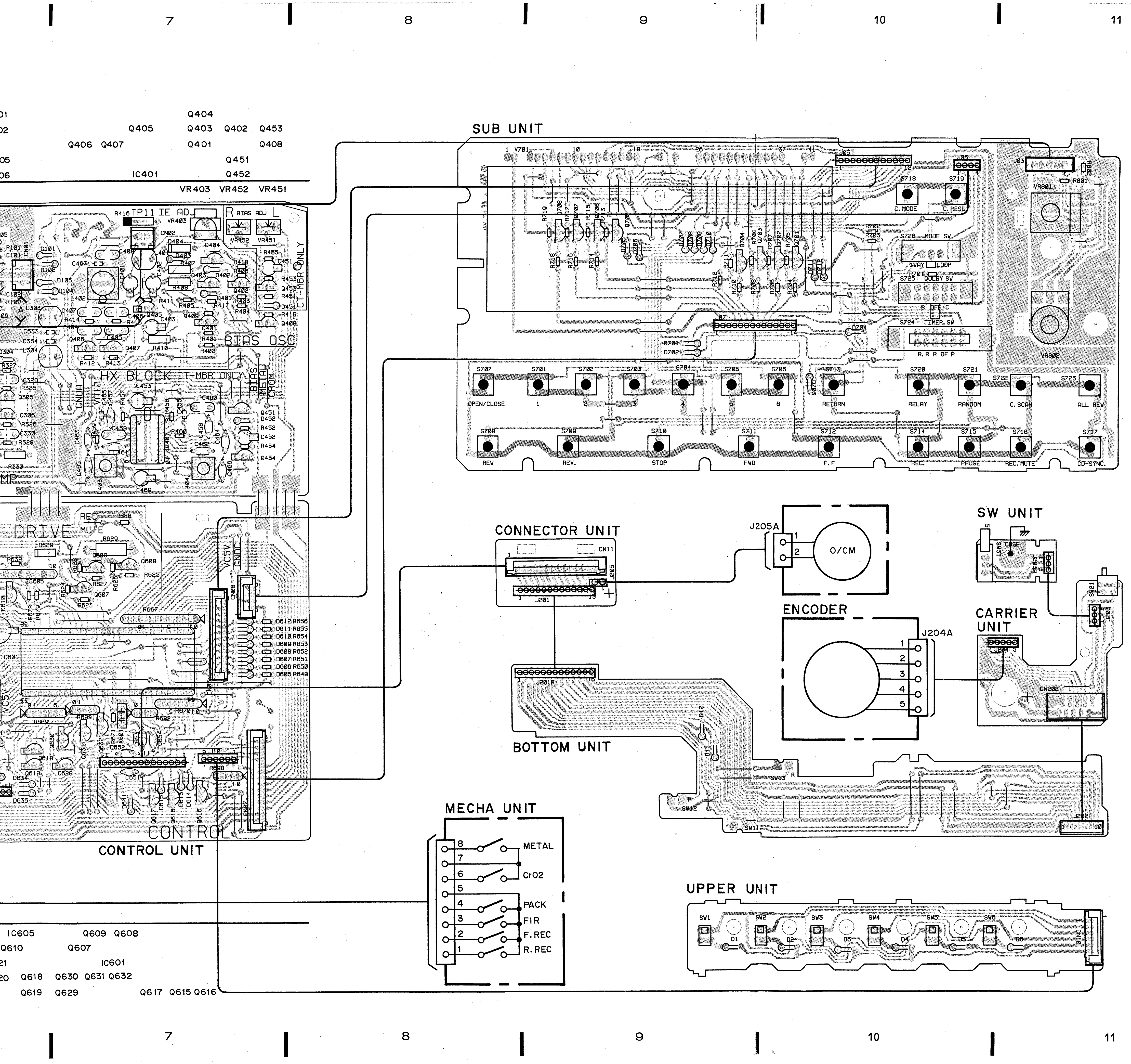
- View from soldering side

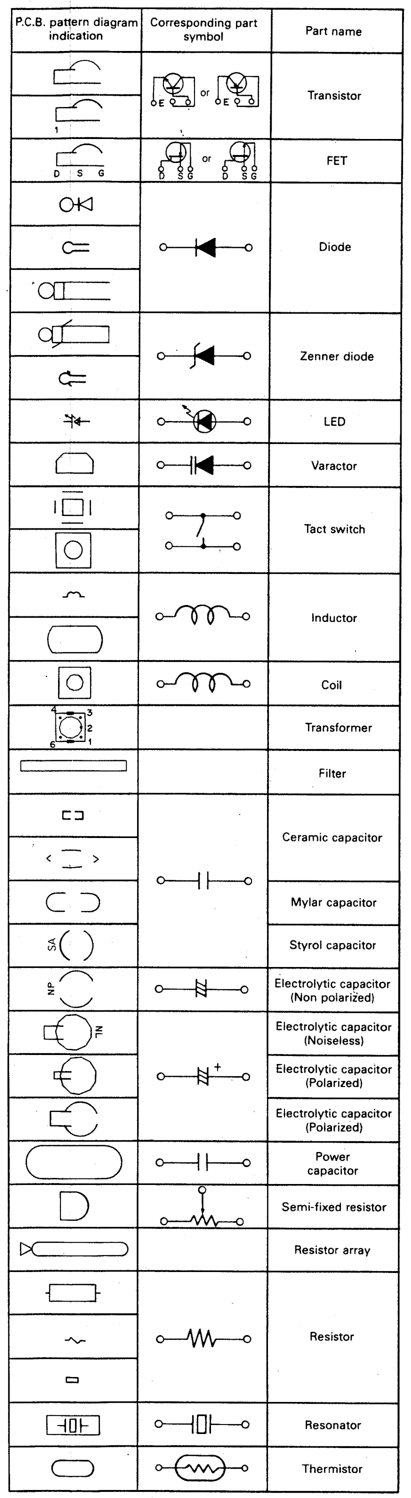

AMP UNIT
MECHA UNIT
MECHA UNIT
H.P JACK UNIT
POWER UNIT
AC POWER CORD
AC120V 60Hz
T1 POWER TRANSFORMER
REMO-CON UNIT
TRANSISTOR A UNIT
TRANSISTOR B UNIT
CONTROL UNIT
HX BLOCK
REC AMP
MECHA DRIVE
METER
LEADER
CHANGER DRIVE
POWER SUPPLY
LINE AMP
LINE MUTE
CD SYNC
DOLBY NR
PB AMP
MUSIC SEARCH
HP AMP
CM
RM
A
B
C
D

4. P.C. BOARDS CONNECTION DIAGRAM

- View from component side


A
B
C
D
H.P JACK UNIT
MECHA UNIT
MECHA UNIT
AC POWER CORD
AC120V 60Hz
POWER UNIT
S1001
C1001
CN1001
T1 POWER TRANSFORMER
REMO-CON UNIT
IC607
AMP UNIT
CT-M6R ONLY
HP AMP
DOLBY NR
PB AMP
PB LEVEL ADJ
REC LEVEL ADJ
MUSIC SEARCH
LINE AMP
METER
LEADER SENS. ADJ
MECHA DRIVE
REC AMP
HX BLOCK
LINE MUTE
CD SYNC
SR
LEADER
CHANGER DRIVE
POWER SUPPLY
1.5A/125V KUC
LINE IN
LINE OUT
SYNCHRO
CONTROL IN
CONTROL OUT
TP1
TP2
TP11
TP12
CM
RM
TRANSISTOR A UNIT
IC501
TRANSISTOR B UNIT
IC502
CONTROL UNIT
Q251
IC201
Q252
IC604
Q603
IC102
Q605
Q606
Q604
Q107
Q105
Q627
Q109
Q106
Q301
Q307
Q302
Q308
IC301
IC101
Q103
Q101
Q104
Q102
Q309
Q303
Q305
Q310
Q304
Q306
Q405
Q406
Q407
IC401
VR302
VR301
VR102
VR101
VR601
IC103
Q601
IC602
IC603
Q612
Q613
Q611
Q614
IC605
Q610
Q609
Q608
Q607
Q201
Q202
Q626
IC503
Q503
Q502
Q501
Q504
IC606
Q622
Q623
Q625
Q624
Q621
Q620
Q618
Q619
Q630
Q631
Q632
Q629
IC601
Q617
Q615

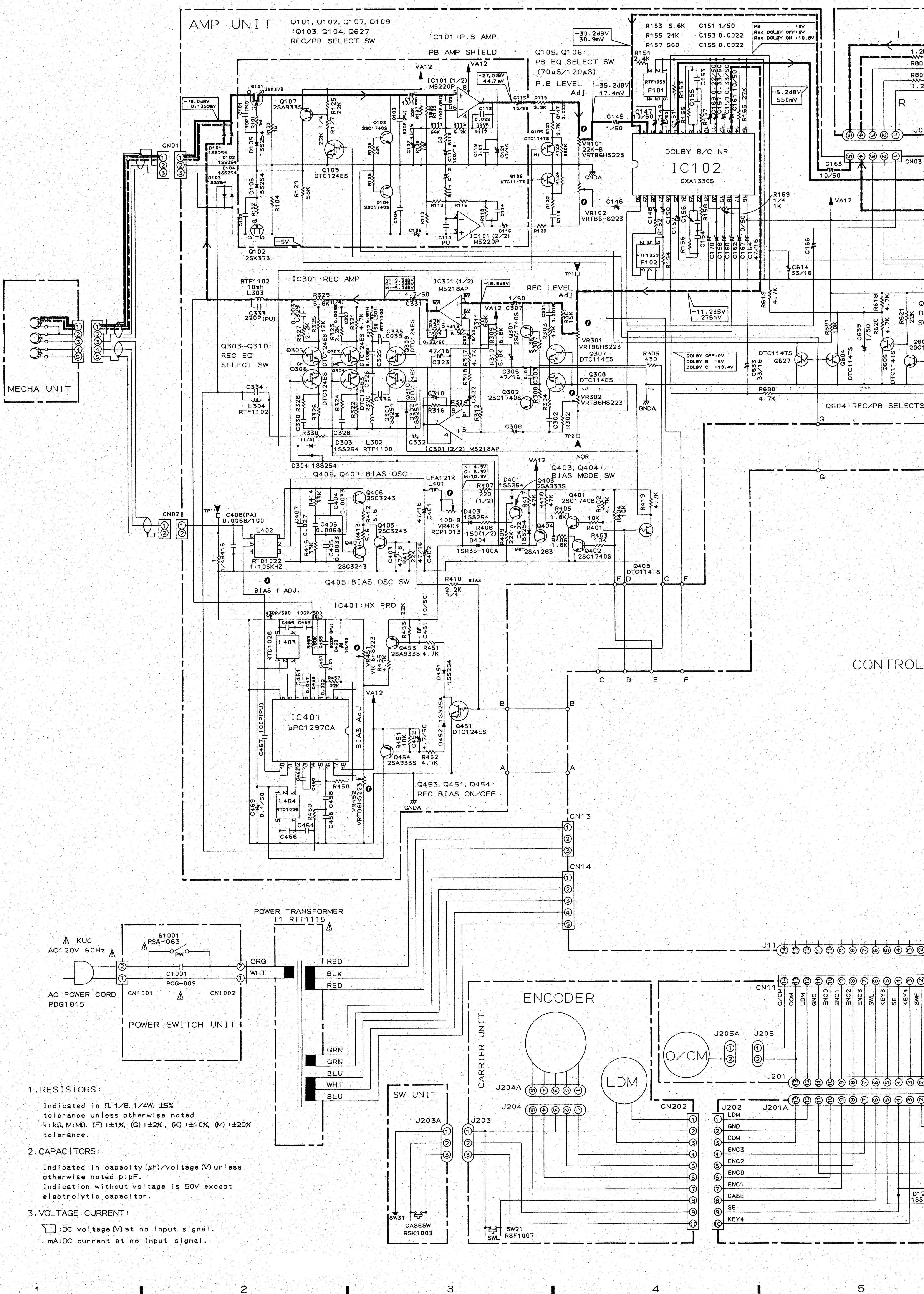

7
8
9
10
11
12
SUB UNIT
OPEN/CLOSE
1
2
3
4
5
6
RETURN
RELAY
RANDOM
C.SCAN
ALL REW
REW
REV.
STOP
FWD
F.F
REC.
PAUSE
REC.MUTE
CD-SYNC.
C.MODE
C.RESET
MODE SW
1WAY
LOOP
DOLBY SW
B OFF C
TIMER.SW
R.R OF P
CONNECTOR UNIT
J205A
O/CM
ENCODER
J204A
SW UNIT
CARRIER UNIT
BOTTOM UNIT
MECHA UNIT
METAL
CrO2
PACK
FIR
F.REC
R.REC
UPPER UNIT
CONTROL UNIT
HX BLOCK
BIAS OSC
DRIVE
CONTROL
IE ADJ
BIAS ADJ
CT-M6R ONLY
IC605
Q609
Q608
Q610
Q607
IC601
Q618
Q630
Q631
Q632
Q619
Q629
Q617
Q615
Q616
Q404
Q405
Q403
Q402
Q453
Q406
Q407
Q401
Q408
Q451
IC401
Q452
VR403
VR452
VR451



P.C.B. pattern diagram indication	Corresponding part symbol	Part name
	or	Transistor
D S G	or	FET
		Diode
		Zenner diode
		LED
		Varactor
		Tact switch
		Inductor
		Coil
		Transformer
		Filter
		Ceramic capacitor
		Mylar capacitor
SA		Styrol capacitor
NP		Electrolytic capacitor (Non polarized)
NL		Electrolytic capacitor (Noiseless)
	+	Electrolytic capacitor (Polarized)
		Electrolytic capacitor (Polarized)
		Power capacitor
		Semi-fixed resistor
		Resistor array
		Resistor
		Resonator
		Thermistor

1. This P.C.B. connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the above Table.
3. The capacitor terminal marked with ▭ shows negative terminal.
4. The diode marked with ○ shows cathode side.
5. The transistor terminal marked with ▭ shows emitter.

5. SCHEMATIC DIAGRAM


1
2
3
4
5
AMP UNIT
Q101, Q102, Q107, Q109
:Q103, Q104, Q627
REC/PB SELECT SW
IC101:P.B AMP
PB AMP SHIELD
Q105, Q106:
PB EQ SELECT SW
(70µS/120µS)
P.B LEVEL
Adj
-30.2dBV
30.9mV
-35.2dBV
17.4mV
-27.0dBV
44.7mV
-78.0dBV
0.1259mV
-5.2dBV
550mV
-11.2dBV
275mV
-18.8dBV
R153 5.6K
R155 24K
R157 560
C151 1/50
C153 0.0022
C155 0.0022
PB :0V
Rec DOLBY OFF:6V
Rec DOLBY ON :10.8V
DOLBY B/C NR
IC102
CXA1330S
IC101 (1/2)
M5220P
IC101 (2/2)
M5220P
VR101
22K-B
VRTB6HS223
VR102
VRTB6HS223
MECHA UNIT
CN01
CN02
CN03
IC301:REC AMP
IC301 (1/2)
M5218AP
IC301 (2/2) M5218AP
REC LEVEL
Adj
Q303~Q310:
REC EQ
SELECT SW
VR301
VRTB6HS223
VR302
VRTB6HS223
DOLBY OFF:0V
DOLBY B :6V
DOLBY C :10.4V
Q604:REC/PB SELECTS
Q406, Q407:BIAS OSC
Q403, Q404:
BIAS MODE SW
Q405:BIAS OSC SW
BIAS f ADJ.
IC401:HX PRO
IC401
µPC1297CA
BIAS AdJ
Q453, Q451, Q454:
REC BIAS ON/OFF
VR451
VRT6HS223
VR452
VRTB6HS223
VR403
RCP1013
NOR
CONTROL
CN13
CN14
CN11
J11
POWER TRANSFORMER
T1 RTT1115
KUC
AC120V 60Hz
AC POWER CORD
PDG1015
S1001
RSA-063
PW
C1001
RCG-009
CN1001
CN1002
POWER SWITCH UNIT
ORG
WHT
RED
BLK
RED
GRN
GRN
BLU
WHT
BLU
CARRIER UNIT
ENCODER
LDM
O/CM
SW UNIT
J203A
J203
J204A
J204
J205A
J205
J201
J202
J201A
CN202
SW31
CASESW
RSK1003
SW21
SWL
RSF1007
O/CM
COM
LDM
GND
ENC0
ENC1
ENC2
ENC3
SWL
KEY3
SE
KEY4
SWF
CASE
VA12
GNDA
-5V

1.RESISTORS:

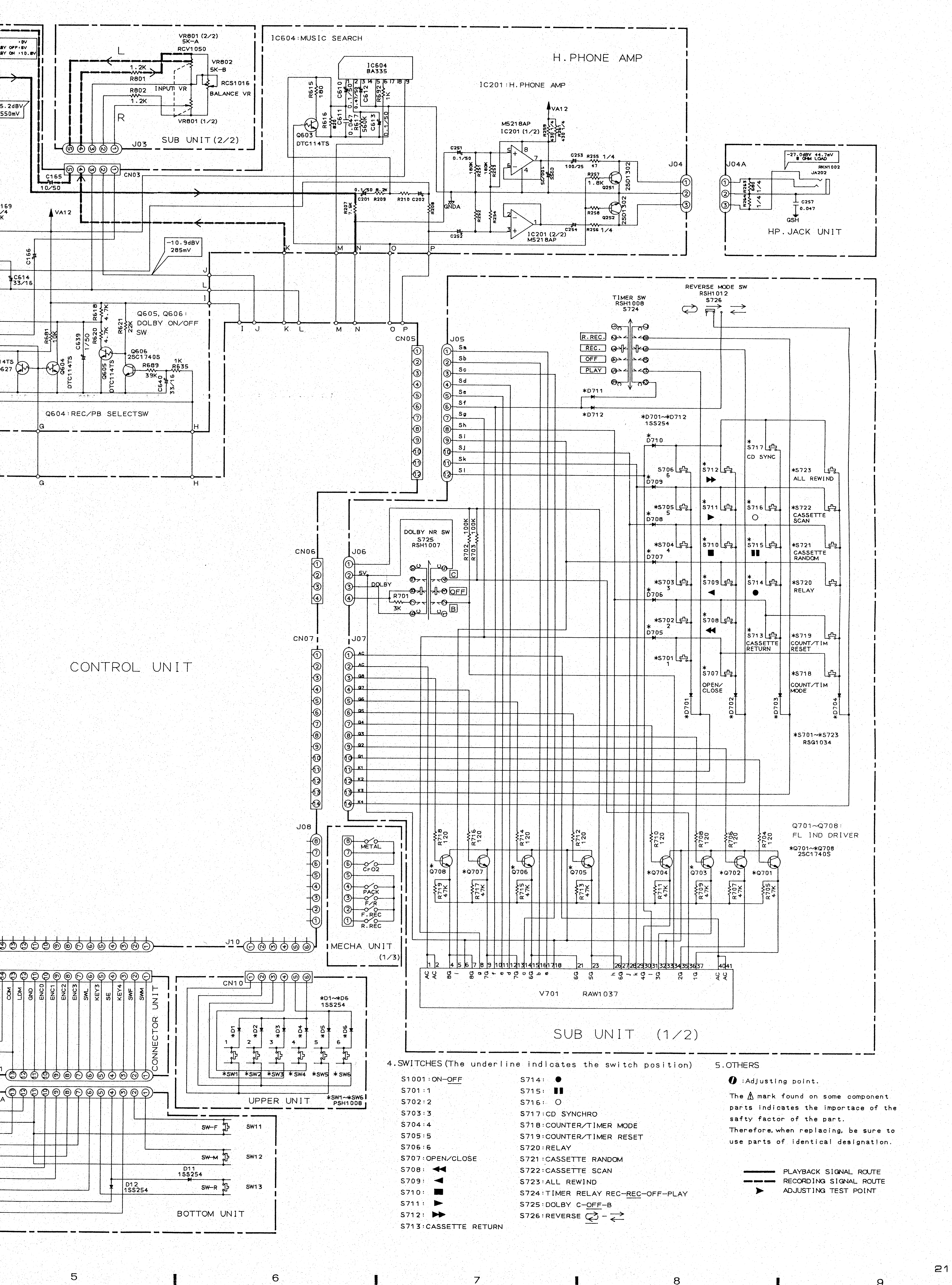
Indicated in Ω, 1/8, 1/4W, ±5%
tolerance unless otherwise noted
k:kΩ, M:MΩ, (F):±1%, (G):±2%, (K):±10%, (M):±20%
tolerance.

2.CAPACITORS:

Indicated in capacity(µF)/voltage(V) unless
otherwise noted p:pF.
Indication without voltage is 50V except
electrolytic capacitor.

3.VOLTAGE CURRENT:

☐:DC voltage(V) at no input signal.
mA:DC current at no input signal.


5
6
7
8
9
CONTROL UNIT
SUB UNIT (1/2)
SUB UNIT (2/2)
H.PHONE AMP
HP.JACK UNIT
MECHA UNIT (1/3)
UPPER UNIT
BOTTOM UNIT
CONNECTOR UNIT
IC604:MUSIC SEARCH
IC604 BA335
IC201:H.PHONE AMP
M5218AP IC201 (1/2)
IC201 (2/2) M5218AP
VR801 (2/2) 5K-A RCV1050
VR801 (1/2)
VR802 5K-B
RCS1016
INPUT VR
BALANCE VR
R801 1.2K
R802 1.2K
L
R
J03
CN03
J04
J04A
C165 10/50
VA12
-5.2dBV 550mV
-10.9dBV 285mV
-27.0dBV 44.7mV 8 OHM LOAD
RKN1002 JA202
C257 0.047
GSH
Q603 DTC114TS
R615 180
R616
C610
C611
C612
C613
R617 560K
R692 1K
R207 7.5K
C201 R209 R210 C202
R208
GNDA
C251 0.1/50
C252
R251
R252
R253
R254
R259
R261
C253 100/25
R255 1/4 47
R257 1.8K
Q251
Q252
2SD1302
R258
C254
R256 1/4
R264 R263 680 1/4 1/4
C166
C614 33/16
R681 10K
Q604 DTC114TS
C639 1/50
R620 4.7K
R618 4.7K
R621 22K
Q605 DTC114TS
Q606 2SC1740S
R689 39K
R635 1K
C640 33/16
Q605, Q606: DOLBY ON/OFF SW
Q604:REC/PB SELECTSW
G
H
I J K L M N O P
CN05
J05
Sa Sb Sc Sd Se Sf Sg Sh Si Sj Sk Sl
CN06
J06
5V
DOLBY
R701 3K
DOLBY NR SW S725 RSH1007
C OFF B
R702 100K
R703 100K
CN07
J07
AC AC Q8 Q7 Q6 Q5 Q4 Q3 Q2 Q1 K1 K2 K3 K4
J08
J10
METAL
CrO2
PACK
F/R
F.REC
R.REC
TIMER SW RSH1008 S724
R.REC.
REC.
OFF
PLAY
REVERSE MODE SW RSH1012 S726
*D711
*D712
*D701~*D712 1SS254
*D701 *D702 *D703 *D704 *D705 *D706 *D707 *D708 *D709 *D710
*S701 1
*S702 2
*S703 3
*S704 4
*S705 5
S706 6
*S707 OPEN/CLOSE
*S708
*S709
*S710
*S711
*S712
*S713 CASSETTE RETURN
*S714
*S715
*S716
*S717 CD SYNC
*S718 COUNT/TIM MODE
*S719 COUNT/TIM RESET
*S720 RELAY
*S721 CASSETTE RANDOM
*S722 CASSETTE SCAN
*S723 ALL REWIND
*S701~*S723 RSG1034
Q701~Q708: FL IND DRIVER
*Q701~*Q708 2SC1740S
R718 120 R716 120 R714 120 R712 120 R710 120 R708 120 R706 120 R704 120
R719 47K R717 47K R715 47K R713 47K R711 47K R709 47K R707 47K R705 47K
V701 RAW1037
AC AC 8G 7G 6G 5G 4G 3G 2G 1G
CN10
*D1~*D6 1SS254
*SW1~*SW6 PSH1008
COM LDM GND ENC0 ENC1 ENC2 ENC3 SWL KEY3 SE KEY4 SWF SWM
SW-F SW11
SW-M SW12
SW-R SW13
D11 1SS254
D12 1SS254

4.SWITCHES (The underline indicates the switch position)

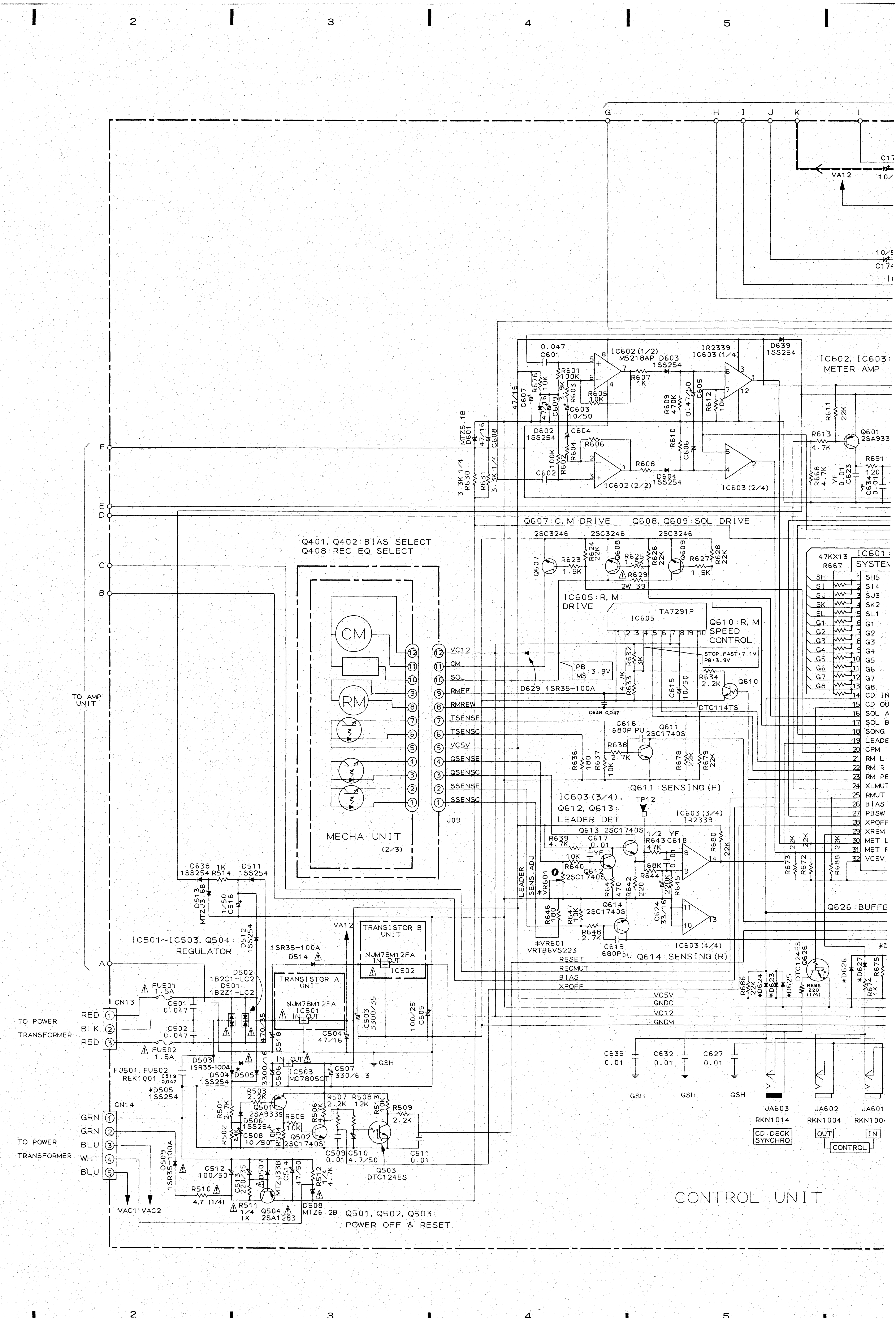
S1001:ON-OFF
S701:1
S702:2
S703:3
S704:4
S705:5
S706:6
S707:OPEN/CLOSE
S708: ◀◀
S709: ◀
S710: ■
S711: ▶
S712: ▶▶
S713:CASSETTE RETURN
S714: ●
S715: ❚❚
S716: ○
S717:CD SYNCHRO
S718:COUNTER/TIMER MODE
S719:COUNTER/TIMER RESET
S720:RELAY
S721:CASSETTE RANDOM
S722:CASSETTE SCAN
S723:ALL REWIND
S724:TIMER RELAY REC-REC-OFF-PLAY
S725:DOLBY C-OFF-B
S726:REVERSE ⟲ - ⇄

5.OTHERS

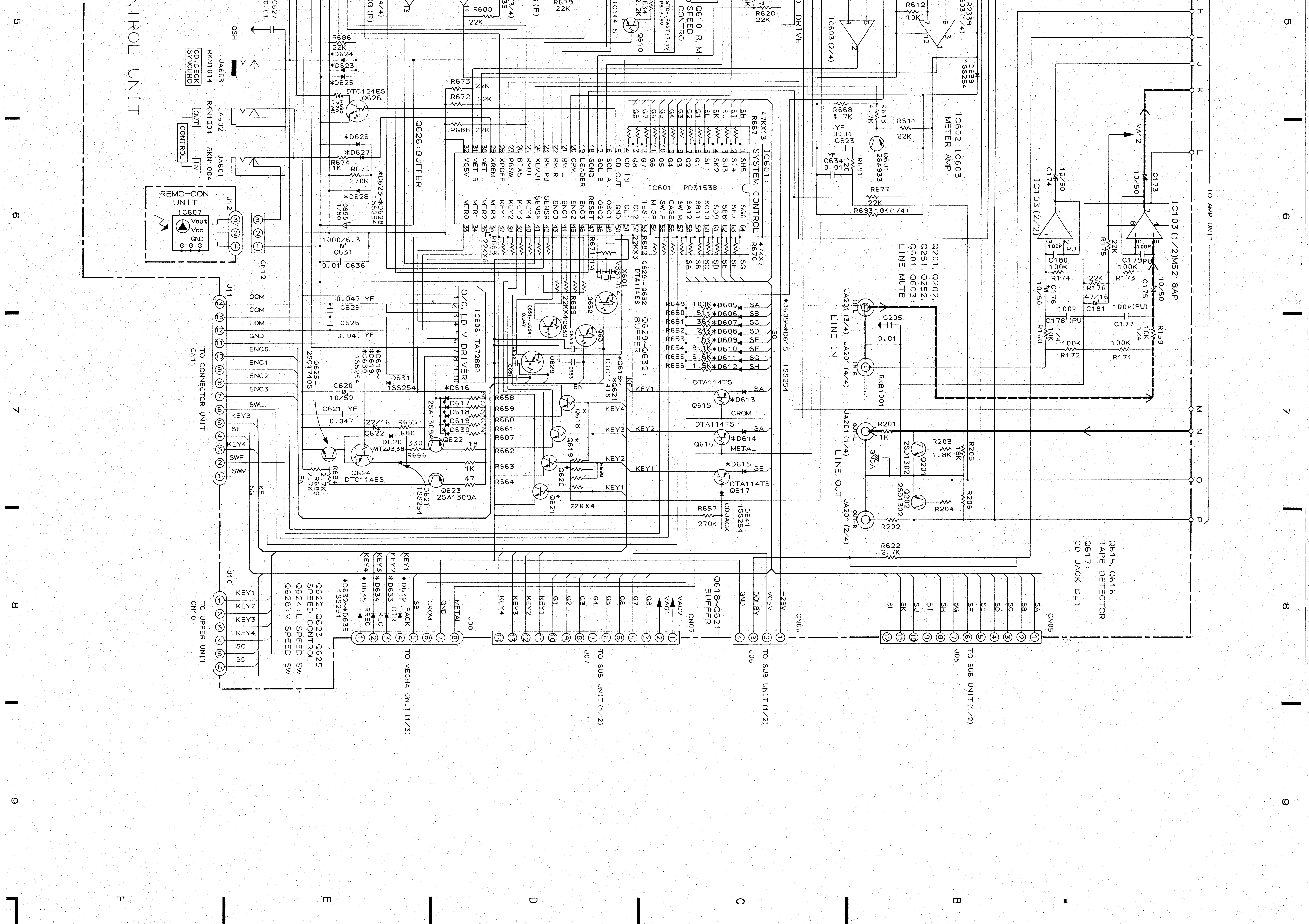
◐ :Adjusting point.

The ⚠ mark found on some component parts indicates the importance of the safty factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

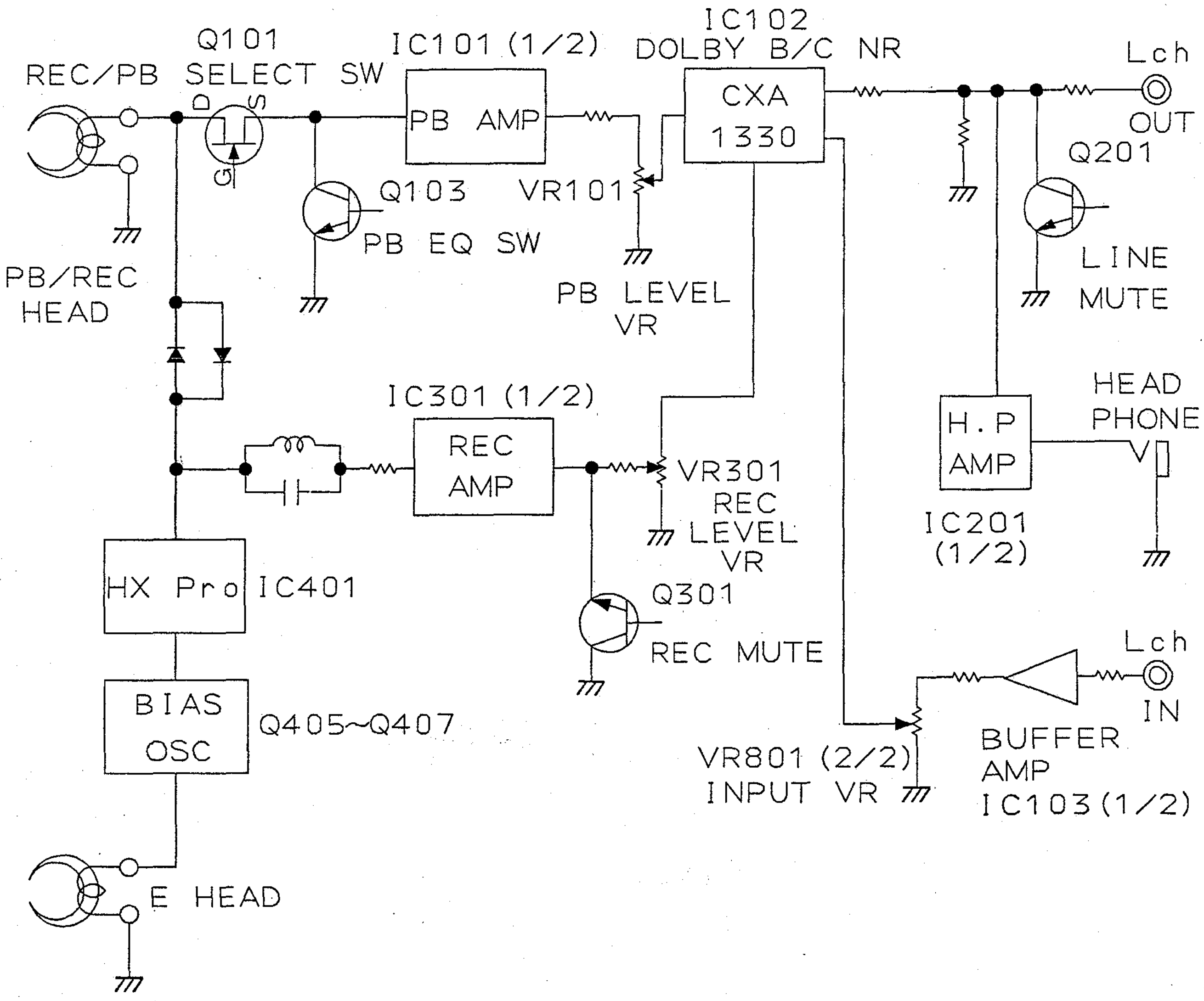
━━ PLAYBACK SIGNAL ROUTE
╍╍ RECORDING SIGNAL ROUTE
▶ ADJUSTING TEST POINT



CONTROL UNIT
TO AMP UNIT
A
B
C
D
E
F
G
H
I
J
K
L
VA12
TO POWER TRANSFORMER
CN13
RED
BLK
RED
CN14
GRN
GRN
BLU
WHT
BLU
VAC1
VAC2
FU501 1.5A
FU502 1.5A
FU501, FU502 REK1001
C501 0.047
C502 0.047
C519 0.047
*D505 1SS254
D509 1SR35-100A
D501 1B2Z1-LC2
D502 1B2C1-LC2
D503 1SR35-100A
D504 1SS254
D505
D506 1SS254
D507 MTZJ33B
D508 MTZ6.2B
D511 1SS254
D512 1SS254
D513 MTZJ3.6B
D514 1SR35-100A
D638 1SS254
R514 1K
C516 1/50
IC501~IC503, Q504: REGULATOR
TRANSISTOR A UNIT
NJM78M12FA
IC501
TRANSISTOR B UNIT
NJM78M12FA
IC502
IC503 MC7805CT
C503 3300/35
C504 47/16
C505 100/25
C506 3300/16
C507 330/6.3
C518 470/35
GSH
R501 2.7K
R502
R503 2.2K
R504 10K
R505 10K
R506 4.7K
R507 2.2K
R508 12K
R509 2.2K
R510 4.7 (1/4)
R511 1/4 1K
R512 1/4 4.7K
R513 10K
C508 10/50
C509 0.01
C510 4.7/50
C511 0.01
C512 100/50
C513 220/35
C514 47/50
Q501 2SA933S
Q502 2SC1740S
Q503 DTC124ES
Q504 2SA1283
Q501, Q502, Q503: POWER OFF & RESET
Q401, Q402: BIAS SELECT
Q408: REC EQ SELECT
MECHA UNIT (2/3)
CM
RM
J09
VC12
CM
SOL
RMFF
RMREW
TSENSE
TSENSC
VC5V
QSENSE
QSENSC
SSENSE
SSENSC
D629 1SR35-100A
PB MS: 3.9V
C638 0.047
Q607: C, M DRIVE
Q608, Q609: SOL DRIVE
2SC3246
Q607
Q608
Q609
R623 1.5K
R624 22K
R625 1.5K
R626 22K
R627 1.5K
R628 22K
R629 2W 39
IC605: R, M DRIVE
IC605 TA7291P
Q610: R, M SPEED CONTROL
STOP. FAST: 7.1V
PB: 3.9V
R632 3K
R633 4.7K
R634 2.2K
C615 10/50
Q610 DTC114TS
C616 680P PU
Q611 2SC1740S
R636 180
R637 10K
R638 2.7K
R678 22K
R679 22K
Q611: SENSING (F)
IC603 (3/4), Q612, Q613: LEADER DET
TP12
IC603 (3/4) IR2339
Q613 2SC1740S
R639 4.7K
C617 0.01 YF
R640 10K
Q612 2SC1740S
R641 470
R642 220
R643 47K
C618 1/2 YF 0.01
R644 68K
R645 220K
R680 22K
C624 33/16
Q614 2SC1740S
R646 180
R647 10K
R648 2.7K
C619 680P PU
*VR601
*VR601 VRTB6VS223
LEADER
SENS. ADJ
IC603 (4/4)
Q614: SENSING (R)
RESET
RECMUT
BIAS
XPOFF
VC5V
GNDC
VC12
GNDM
C635 0.01
C632 0.01
C627 0.01
R686 22K
*D624
*D623
*D625
Q626 DTC124ES
R695 220 (1/4)
*D626
*D627
R674 1K
R675
JA603 RKN1014
CD. DECK SYNCHRO
JA602 RKN1004
OUT
JA601 RKN1004
IN
CONTROL
Q626: BUFFER
R673 22K
R672 22K
R688 22K
IC602, IC603: METER AMP
IC602 (1/2) M5218AP
IC602 (2/2)
IC603 (1/4) IR2339
IC603 (2/4)
D602 1SS254
D603 1SS254
D604 1SS254
D639 1SS254
D601 MTZ5.1B
R630 3.3K 1/4
R631 3.3K 1/4
C608 47/16
C607 47/16
C601 0.047
C602
C603 10/50
C604
C605 0.47/50
C606
C609
R601 100K
R602 100K
R603 3.9K
R604
R605 10K
R606
R607 1K
R608
R609 470K
R610
R612 10K
R676 10K
R611 22K
R613 4.7K
R668 4.7K
Q601 2SA933
C623 YF 0.01
C634 YF 0.01
R691 120
IC601: SYSTEM
47KX13 R667
SH
SI
SJ
SK
SL
G1
G2
G3
G4
G5
G6
G7
G8
SH5
S14
SJ3
SK2
SL1
CD IN
CD OU
SOL A
SOL B
SONG
LEADE
CPM
RM L
RM R
RM PE
XLMUT
RMUT
BIAS
PBSW
XPOFF
XREM
MET L
MET R
VC5V
C17
C174
2
3
4
5


CONTROL UNIT
JA603 RKN1014 CD.DECK SYNCHRO
JA602 RKN1004 OUT CONTROL
JA601 RKN1004 IN
REMO-CON UNIT
IC607
Vout
Vcc
GND
J12
CN12
1000/6.3 C631
0.01 C636
J11
TO CONNECTOR UNIT CN11
OCM
COM
LDM
GND
ENC0
ENC1
ENC2
ENC3
SWL
KEY3
SE
KEY4
SWF
SWM
KE
SG
J10
TO UPPER UNIT CN10
KEY1
KEY2
KEY3
KEY4
SC
SD
Q622, Q623, Q625: SPEED CONTROL
Q624: L SPEED SW
Q628: M SPEED SW
*D632~*D635 1SS254
J08
TO MECHA UNIT (1/3)
PACK
DIR
FREC
RREC
SB
CROM
GND
METAL
J07
CN07
TO SUB UNIT (1/2)
KEY4
KEY3
KEY2
KEY1
G1
G2
G3
G4
G5
G6
G7
G8
VAC1
VAC2
Q618~Q621: BUFFER
J06
CN06
TO SUB UNIT (1/2)
GND
DOLBY
VC5V
-29V
J05
CN05
TO SUB UNIT (1/2)
SL
SK
SJ
SI
SH
SG
SF
SE
SD
SC
SB
SA
Q626: BUFFER
DTC124ES Q626
*D623~*D628 1SS254
IC601 PD3153B
IC601: SYSTEM CONTROL
47KX13 R667
47KX7 R670
IC606 TA7288P
O/C, LD M DRIVER
Q629~Q632: BUFFER
DTA114ES
DTC114TS
Q625 2SC1740S
Q624 DTC114ES
Q622 2SA1309A
Q623 2SA1309A
D620 MTZJ3.3B
D621 1SS254
D631 1SS254
*D616~*D619, *D630 1SS254
*D605~*D615 1SS254
DTA114TS Q615 *D613 CROM
DTA114TS Q616 *D614 METAL
*D615 Q617 DTA114TS
D641 1SS254 CDJACK
R657 270K
IC602, IC603: METER AMP
IC603 (2/4)
Q601 2SA933
IC103 (2/2)
IC103 (1/2) M5218AP
VA12
Q201, Q202, Q251, Q252, Q601, Q603: LINE MUTE
JA201 (3/4) JA201 (4/4) LINE IN
RKB1001
JA201 (1/4) JA201 (2/4) LINE OUT
Q201 2SD1302
Q202 2SD1302
R622 2.7K
TO AMP UNIT
Q615, Q616: TAPE DETECTOR
Q617: CD JACK DET.
Q610: R, M SPEED CONTROL
STOP, FAST: 7.1V PB: 3.9V
H
I
J
K
L
M
N
O
P
5
6
7
8
9
F
E
D
C
B

6. BLOCK DIAGRAM


REC/PB SELECT SW
Q101
D
S
G
IC101 (1/2)
PB AMP
IC102
DOLBY B/C NR
CXA
1330
Lch
OUT
Q201
LINE
MUTE
Q103
PB EQ SW
VR101
PB LEVEL
VR
PB/REC
HEAD
IC301 (1/2)
REC
AMP
VR301
REC
LEVEL
VR
H.P
AMP
HEAD
PHONE
IC201
(1/2)
HX Pro
IC401
Q301
REC MUTE
BIAS
OSC
Q405~Q407
Lch
IN
BUFFER
AMP
IC103(1/2)
VR801 (2/2)
INPUT VR
E HEAD

7. ELECTRICAL PARTS LIST

NOTES :

- Parts without part number cannot be supplied.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The ⚠ mark found on some component parts indicates the impotance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

560 Ω　56×10^1　561 ………………………… RD1/4PS $\boxed{5}\boxed{6}\boxed{1}$ J
47k Ω　47×10^3　473 ………………………… RD1/4PS $\boxed{4}\boxed{7}\boxed{3}$ J
0.5 Ω　0R5 ………………………… RN2H $\boxed{0}\boxed{R}\boxed{5}$ K
1 Ω　010 ………………………… RS1P $\boxed{0}\boxed{1}\boxed{0}$ K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k Ω　562×10^1　5621 ………………………… RN1/4SR $\boxed{5}\boxed{6}\boxed{2}\boxed{1}$ F

Miscellaneous Parts

P.C. BOARD ASSEMBLY

Mark	Symbol & Description	Part No.
	Amp unit	
	Control unit	
	HP. jack unit	
	Remo-con unit	
	Power switch unit	
	Transistor A unit	
	Transistor B unit	
	Sub unit	
	Bottom unit	
	Upper unit	
	Carrier unit	
	Connector unit	
	SW unit	

OTHERS

Mark	Symbol & Description	Part No.
⚠	Strain relief	CM-22C
⚠	Power cord	PDG1015
⚠	FU1, FU2 Fuse (1.5A)	REK1001
⚠	T1 Power transformer	RTT1115
	R/P, E head	RPB1030
	Motor assembly	RXM1029
	Motor assembly (Main)	RXM1032
	Solenoid	RXP1010
	Photo transistor	SPI-335-34-C

Amp Unit

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	IC604	BA335
	IC102	CXA1330S
	IC201, IC301	M5218AP
	IC101	M5220P
	IC401	UPC1297CA
	Q307, Q308	DTC114ES
	Q105, Q106, Q408, Q603-Q605, Q627	DTC114TS
	Q109, Q303-Q306, Q309, Q310, Q451	DTC124ES
	Q404	2SA1283
	Q107, Q403, Q453, Q454	2SA933S
	Q103, Q104, Q301, Q302, Q401, Q402, Q606	2SC1740S
	Q405-Q407	2SC3243
	Q251, Q252	2SD1302
	Q101, Q102	2SK373
	D404	1SR35-100A
	D101-D106, D301-D304, D401-D403, D451, D452	1SS254

COILS AND FILTER

Mark	Symbol & Description	Part No.
	L401 Radial inductor	LFA121K
	L402 Oscillator coil	RTD1022
	L403, L404 Step-up coil	RTD1028
	F101, F102 MPX Filter	RTF1059
	L301, L302 Coil (6.8mH)	RTF1100
	L303, L304 Coil (10mH)	RTF1102

CAPACITORS

Mark	Symbol & Description	Part No.
	C463, C464	CCCSL101K500
	C101, C102	CCPUSL100J50
	C105, C106	CEANL100M16
	C111, C112	CEANL101M10
	C201, C202, C251, C252, C469, C610, C613	CEASR10M50

Mark	Symbol & Description	Part No.
	C169, C170	CEASR22M50
	C157−C160, C309, C310	CEASR33M50
	C612	CEASR47M50
	C145, C146, C151, C152, C307, C308, C639	CEAS010M50
	C115, C116, C147−C150, C161, C162, C165−C167, C321, C322, C451, C453	CEAS100M50
	C253−C255	CEAS101M25
	C614, C633, C640	CEAS330M16
	C331, C332, C452	CEAS4R7M50
	C107, C121, C164, C305, C323, C401−C403	CEAS470M16
	C301, C302	CFTXA182J50
	C153−C156	CFTXA222J50
	C113, C114, C117, C118, C459, C460	CFTXA223J50
	C327−C330, C404, C405	CFTXA332J50
	C335, C336	CFTXA392J50
	C406	CFTXA682J50
	C407	CFTXA273J50
	C325, C326	CFTXA822J50
	C119, C303, C457, C458	CKCYF103Z50
	C461, C462, C611	CKCYF473Z50
	C109, C110, C467	CKPUYB101K50
	C333, C334	CKPUYB221K50
	C103, C104, C455, C456	CKPUYB821K50
	C408	CQPA682J100
	C465, C466 (430p)	RCG1005

RESISTORS

Mark	Symbol & Description	Part No.
	VR403 Semi−fixed (100 Ω)	RCP1013
	VR101, VR102, VR301, VR302, VR451, VR452 Semi−fixed (22k)	VRTB6HS223
	R407, R408	RD½PMF□□□J
	R127, R169, R255, R256, R259, R261, R329, R330, R410, R416	RD¼PM□□□J
	Other resistors	RD⅙PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
	CN3 Jumper connector 5P	KPC5

Control Unit

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	IC603	IR2339
⚠	IC503	MC7805CT
	IC103, IC602	M5218AP
	IC601	PD3153B
	IC606	TA7288P
	IC605	TA7291P
	Q629−Q632	DTA114ES
	Q615−Q617	DTA114TS
	Q624	DTC114ES
	Q610, Q618−Q621	DTC114TS
	Q503, Q626	DTC124ES
⚠	Q504	2SA1283
	Q622, Q623	2SA1309A
	Q501, Q601	2SA933S
	Q502, Q611−Q614, Q625	2SC1740S
	Q607−Q609	2SC3246
	Q201, Q202	2SD1302
	D620	MTZJ3.3B
⚠	D507	MTZJ33B
	D513	MTZ3.6B
	D601	MTZ5.1B
⚠	D508	MTZ6.2B
⚠	D502	1B2C1−LC2
⚠	D501	1B2Z1−LC2
⚠	D503, D509, D514	1SR35−100A
	D629	1SR35−100A
	D504−D506, D511, D512, D602−D619, D621, D623−D628, D630−D635, D638, D639, D641	1SS254

CAPACITORS

Mark	Symbol & Description	Part No.
	C605, C606	CEASR47M50
	C516, C655	CEAS010M50
	C173−C176, C508, C603, C604, C615, C620	CEAS100M50
	C505	CEAS101M25
	C512	CEAS101M50
	C631	CEAS102M6R3
	C622	CEAS220M16
	C513	CEAS221M35
	C624	CEAS330M16
	C507	CEAS331M6R3
	C506	CEAS332M16
	C503	CEAS332M35
	C510	CEAS4R7M50
	C181, C504, C607−C609	CEAS470M16
	C514	CEAS470M50
	C518	CEAS471M35
	C205, C509, C511, C617, C618, C623, C627, C632, C634−C636	CKCYF103Z50
	C501, C502, C601, C602, C621, C625, C626, C519, C638, C651−C654	CKCYF473Z50
	C177−C180	CKPUYB101K50
	C616, C619	CKPUYB681K50

RESISTORS

Mark	Symbol & Description	Part No.
	R667	RA13T473J
	R682	RA3T223J
	R698, R699	RA4T223J
	R669	RA6T223J
	R670	RA7T473J

Mark	Symbol & Description	Part No.
	R643	RD½LF473J
⚠	R629	RS2LMF390J
	VR601 Semi−fixed (22k)	VRTB6VS223
	R159, R160, R512, R630, R631, R693, R695	RD¼PM□□□J
⚠	R510, R511	RD¼PM□□□J
	Other resistors	RD⅙PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
	JA201 Pin jack 4P	RKB1001
	JA601, JA602 Remote control jack	RKN1004
	JA603 Mini jack	RKN1014
	X601 Ceramic oscillator	VSS1014

HP. jack Unit

CAPACITOR

Mark	Symbol & Description	Part No.
	C257	CKCYF473Z50

RESISTORS

Mark	Symbol & Description	Part No.
	R263, R264	RD¼PM681J

OTHERS

Mark	Symbol & Description	Part No.
	JA202 Headphone jack	RKN1002

Remo−con Unit

OTHERS

Mark	Symbol & Description	Part No.
	Remote sensor unit	GP1U52X

Power Switch Unit

SWITCH

Mark	Symbol & Description	Part No.
⚠	S1001 Power switch (POWER)	RSA−063

CAPACITOR

Mark	Symbol & Description	Part No.
⚠	C1001 (0.01 μF/AC400V)	RCG−009

Transistor A Unit

SEMICONDUCTOR

Mark	Symbol & Description	Part No.
⚠	IC501	NJM78M12FA

Transistor B Unit

SEMICONDUCTOR

Mark	Symbol & Description	Part No.
⚠	IC502	NJM78M12FA

Sub Unit

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	Q701−Q708	2SC1740S
	D701−D712	1SS254

SWITCHES

Mark	Symbol & Description	Part No.
	S701−S723 Tact switch (1, 2, 3, 4, 5, 6, OPEN/CLOSE, REW, REV, STOP, FWD, FF, RETURN, REC, PAUSE, REC.MUTE, CD SYNC, C.MODE, C.RESET, RELAY, RANDOM, C.SCAN, ALL REW)	RSG1034
	S725 Slide switch (DOLBY NR)	RSH1007
	S724 Slide switch (TIMER)	RSH1008
	S726 Slide switch (REVERSE MODE)	RSH1012

RESISTORS

Mark	Symbol & Description	Part No.
	VR802 Variable resistor (5kB)	RCS1016
	VR801 Variable resistor (5k−A)	RCV1050
	Other resistors	RD⅙PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
	Fluorescent indicator	RAW1037

Bottom Unit

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	D11, D12	1SS254

Upper Unit

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
	D1−D6	1SS254

SWITCHES

Mark	Symbol & Description	Part No.
	S1−S6 Push switch (1, 2, 3, 4, 5, 6)	PSH1008

Carrier Unit

Mark	Symbol & Description	Part No.
	S21 Micro switch	RSF1007

OTHERS

Mark	Symbol & Description	Part No.
	CN202 Connector	5597-10APB

Connector Unit

There is no supply part in this unit.

SW unit

SWITCH

Mark	Symbol & Description	Part No.
	S31 Lever switch	RSK1003

8. ADJUSTMENTS

8.1 MECHANICAL ADJUSTMENT

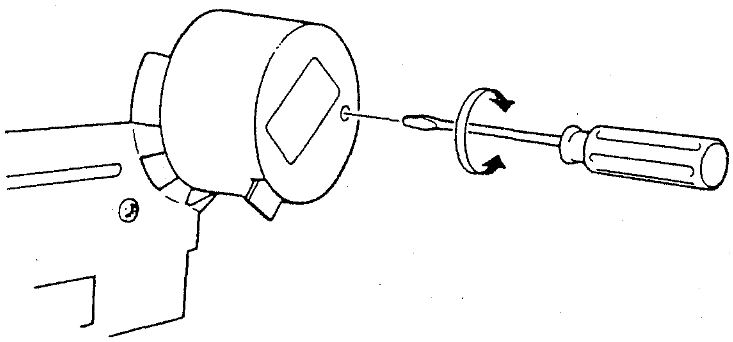
1. Tape Speed Adjustment			
Mode	Test tape	Adjustment position	Specification rating (playback frequency)
PLAY	Play the STD-301 tape (3 kHz)	Capstan motor adjustment VR	3000 Hz±5 Hz
			

Fig. 8−1

8.2 ELECTRICAL ADJUSTMENTS

Adjustment Conditions

1. The mechanical adjustments must be completed first.
2. The head must be cleaned and demagnetized.
3. Turn power on allow the deck to warm up for at least a few minutes before commencing any electrical adjustments.
4. The reference signal is 0dBv=1Vrms.
5. Connect a 50 kΩ (or between 47k to 52 kΩ) load resistance to the OUTPUT terminals.
6. Unless otherwise specified, the switches listed below are left in the positions indicated.
   DOLBY NR : OFF
   TAPE SELECTOR : NORM

Test Tapes

STD-331B	: Playback adjustments (See Fig. 8-2)
STD-630	: NORMAL blank tape
STD-620	: CrO₂ blank tape
STD-610	: METAL blank tape

List of Adjustments

Playback sections

1. Head azimuth adjustment.
2. Playback level adjustment.

Recording sections

1. Bias oscillator adjustment.
2. Erase current adjustment.
3. Recording bias adjustment.
4. Recording level adjustment.
5. Level meter check.
6. Leader tape detection operation adjustment.

NOTE: This unit has an automatic tape selection feature.

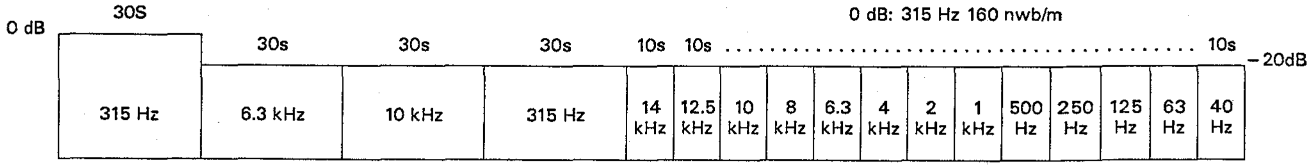
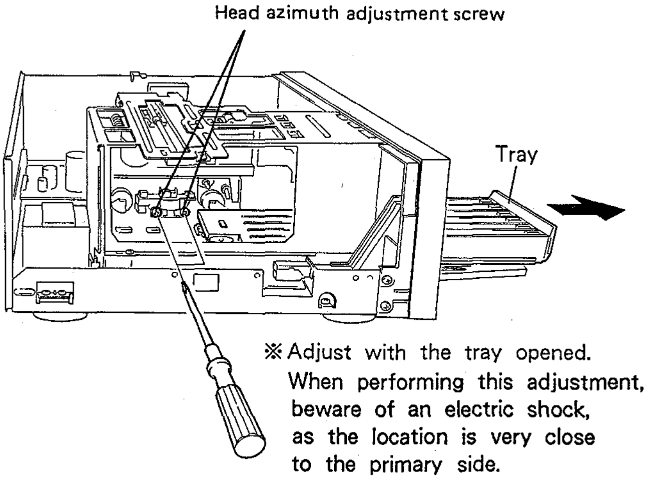

0 dB
30S
0 dB: 315 Hz 160 nwb/m
30s
30s
30s
10s
10s
10s
–20dB
315 Hz
6.3 kHz
10 kHz
315 Hz
14 kHz
12.5 kHz
10 kHz
8 kHz
6.3 kHz
4 kHz
2 kHz
1 kHz
500 Hz
250 Hz
125 Hz
63 Hz
40 Hz

Fig. 8-2. Constants of the test tape STD-331B


Head azimuth adjustment screw
Tray

※Adjust with the tray opened.
When performing this adjustment, beware of an electric shock, as the location is very close to the primary side.

Fig. 8-3. Head azimuth adjustment

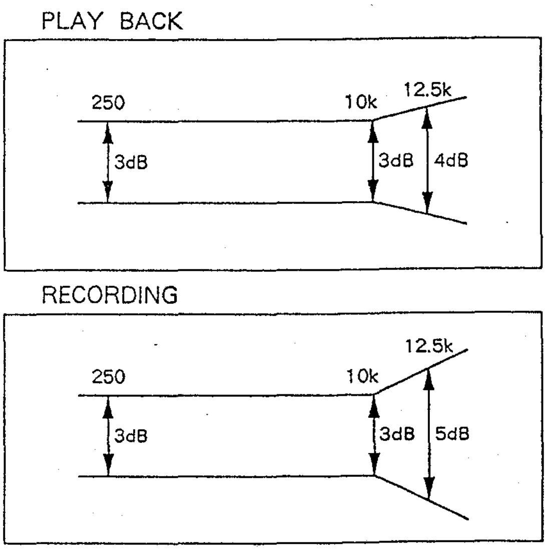


Fig. 8-4. Allowable playback frequency response zone

PLAYBACK SECTION

1. Head Azimuth Adjustment

- Turn VR101 and VR102 to mechanical center positions.

No.	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1.	PLAY	Play the 10 kHz/−20 dB section of STD-331B test tape.	Head azimuth adjustment screw. (See Fig. 8-3)	LINE OUT	Maximum playback signal level.	
2.	STOP	Lock the screw with screw lock after completing adjustment.				

2. Playback level Adjustment

- This adjustment determines the DOLBY NR level, and must be performed with great care.

No.	Mode	Input signal & test tape	Adjustment location		Measuring location	Adjustment value	Remarks
1.	PLAY	Play the 315 Hz/0 dB section of the STD-331B test tape.	Deck I	VR101 (Lch) VR102 (Rch)	TP. 1 (Lch) TP. 2 (Rch)	−10.7 dBv	

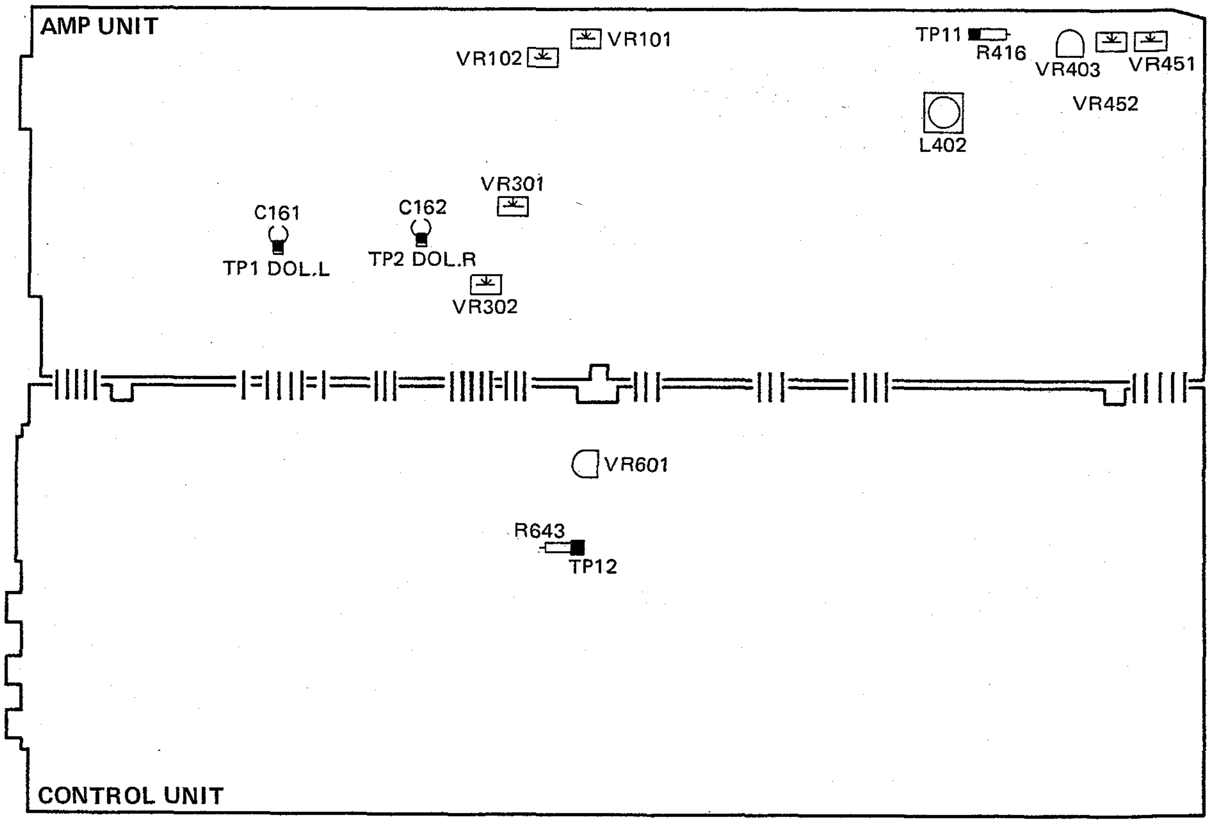

AMP UNIT
VR101
VR102
TP11
R416
VR403
VR451
VR452
L402
VR301
C161
C162
TP1 DOL.L
TP2 DOL.R
VR302
VR601
R643
TP12
CONTROL UNIT

Fig. 8-5. Adjusting Points

RECORDING SECTION

1. Bias Oscillator Adjustment

No.	Mode	Input signal & test tape	Adjustment location		Measuring location	Adjustment value	Remarks
1.	REC	Load the STD-610 test tape with no input signal.	Deck I	L 402	TP. 11	105 kHz ±300 Hz	

2. Erase Current Adjustment

No.	Mode	Input signal & test tape	Adjustment location		Measuring location	Adjustment value	Remarks
1.	REC	Load the STD-610 test tape with no input signal.	Deck I	VR403	TP. 11	165 mV AC	

3. Recording Bias Adjustment

- After the adjustment, caution should be exercised so as not to become under bias by checking the distortion rate.

No.	Mode	Input signal & test tape	Adjustment location		Measuring location	Adjustment value	Remarks
1.	STOP	Set the TAPE SELECTOR switch to the NORM position.					
2.	REC	Record the 315 Hz and 6.3 kHz signals at −20 dBv input level and playback.	Deck I	VR451 (Lch) VR452 (Rch)	LINE OUT	Repeatedly record, playback and adjust so that the playback level of 6.3 kHz signal becomes +1.0 dB±0.5 dB when compared with the 315 Hz signal.	

4. Recording Level Adjustment

No.	Mode	Input signal & test tape	Adjustment location		Measuring location	Adjustment value	Remarks
1.	STOP	Set the TAPE SELECTOR switch to the NORM position.					
2.	REC PAUSE	Apply a 315 Hz/0 dBv signal to the line Input terminals, load the STD-630 test tape.	Rec Level control volume		TP. 1 (Lch) TP. 2 (Rch)	−11.2 dBv	
3.	STOP	Set the DOLBY NR switch to the ON position. (DOLBY B)					
4.	REC/ PLAY	Record the above signal onto the STD-630 test tape, and playback.	Deck I	VR301 (Lch) VR302 (Rch)	TP. 1 (Lch) TP. 2 (Rch)	Repeatedly record, playback and adjust so that the playback signal level becomes −11.2 dB.	
5.	STOP	Set the TAPE SELECTOR switch to the CrO2 position.					
6.	REC/ PLAY	Record the above signal onto the STD-620 test tape, and playback.	Check		TP. 1 (Lch) TP. 2 (Rch)	−11.2 dBv ±1.5 dB	
7.	STOP	Set the TAPE SELECTOR switch to the METAL position.					
8.	REC/ PLAY	Record the above signal onto the STD-610 test tape, and playback.	Check		TP. 1 (Lch) TP. 2 (Rch)	−11.2 dBv ±1.5 dB	

5. Level Meter Check

No.	Mode	Input signal & test tape	Adjustment location	Measuring location	Adjustment value	Remarks
1.	REC PAUSE	Apply a 315 Hz/−10 dBv (316 mV) signal to the Line Input terminals.	Rec Level control volume	TP. 1 (Lch) TP. 2 (Rch)	Check that the level meters "0 dB" light up within −11.2 dBv ±2 dB of the signal output level.	

6. Leader Tape Detection Operation Adjustment

No.	Mode	Input signal & test tape	Adjustment location		Measuring location		Adjustment value	Remarks
1.	PLAY	No input-load an empty cassette half.	Deck I	VR601	Deck I	TP. 12	$1.0\text{V} \pm ^{0.2}_{0}\text{V}$ (DC)	
2.	Check that the leader tape is correctly detected (inboth FWD and REV directions when in endless reverse mode).							

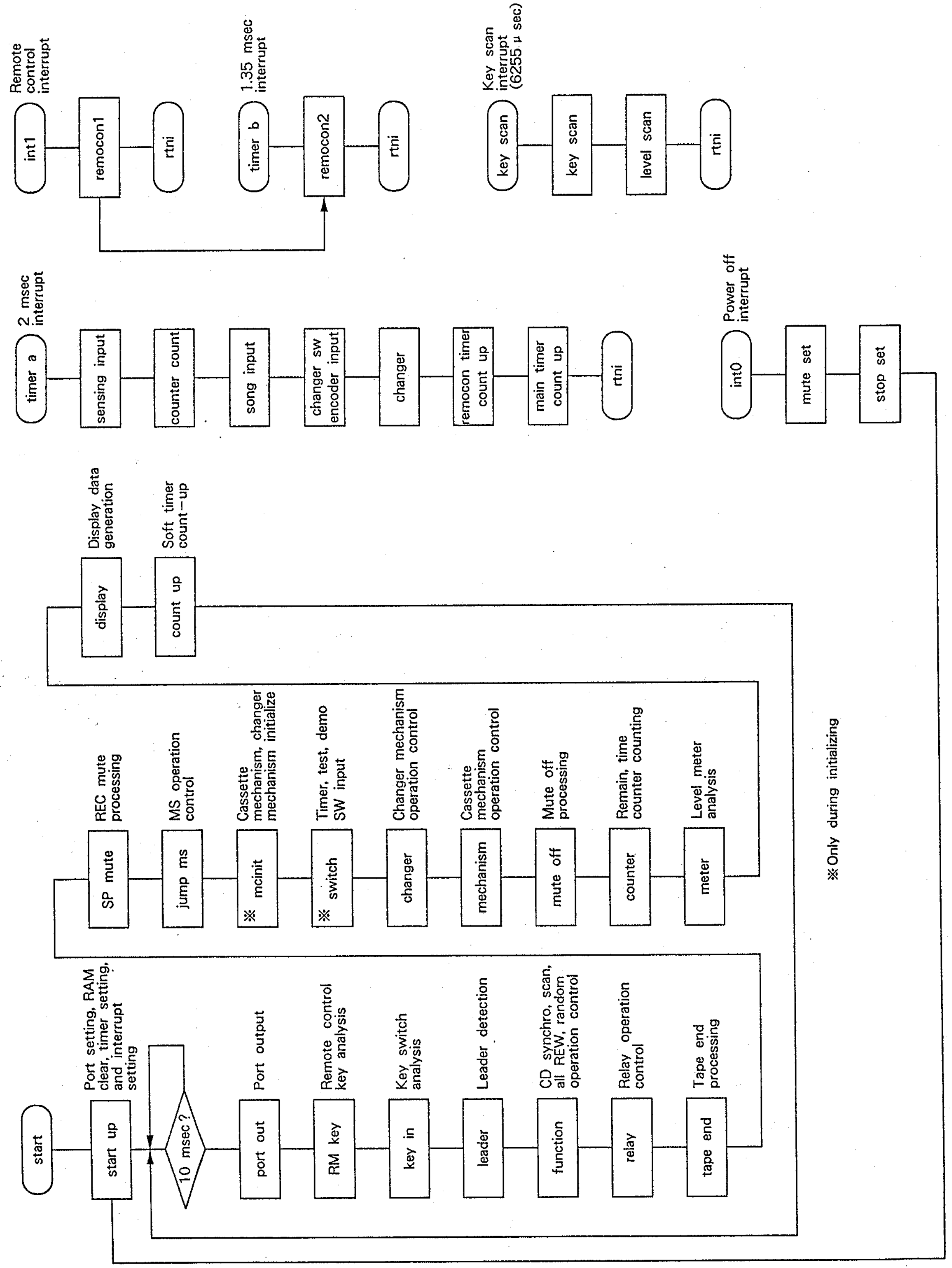
9. IC AND CIRCUIT DESCRIPTIONS

9.1 PD3153B PIN DESCRIPTION

Pin No.	I/O	Pin Name	Pin Description	Pin Processing
1	O	Sh	Segment output, key scan output, and level scan output	Pull-down
2	O	Si	Segment output, key scan output, and level scan output	Pull-down
3	O	Sj	Segment output, key scan output, and level scan output	Pull-down
4	O	Sk	Segment output, key scan output, and level scan output	Pull-down
5	O	Sl	Segment output, key scan output, and level scan output	Pull-down
6	O	G1	Grid output	Pull-down
7	O	G2	Grid output	Pull-down
8	O	G3	Grid output	Pull-down
9	O	G4	Grid output	Pull-down
10	O	G5	Grid output	Pull-down
11	O	G6	Grid output	Pull-down
12	O	G7	Grid output	Pull-down
13	O	G8	Grid output	Pull-down
14	I	CDIN	Synchro control input	Pull-up
15	O	CDOUT	Synchro control output	
16	O	SOLA	Solenoid control, solenoid ON when "H"	
17	O	SOLB	Power drop control with solenoid ON, power dropped when "H"	
18	I	SONG	Program interrupt detection, program interruption when "L"	Pull-up
19	I	LEADER	Leader detection pulse input, leader section ON when "H"	Pull-up
20	O	CPM	Capstan motor control, capstan motor ON when "H"	
21	O	RML	Reel motor rotating direction control, REV direction ON when "H"	Pull-down
22	O	RMR	Reel motor rotation direction control, FWD direction ON when "H"	Pull-down
23	O	RMPB	Reel motor torque control, play torque ON when "H"	
24	O	XLMUT	Line mute control, mute ON when "L"	
25	O	RMUT	Record mute control, mute ON when "H"	
26	O	BIAS	Bias OSC control, ON when "H"	
27	O	PBSW	REC PB head switching, PB ON (during PLAY and MS) when "H"	
28	I	XPOFF	Power OFF pulse input, normally "H" ; interrupt when "L"	
29	I	XREM	REMOCON pulse input	
30	I	METL	Lch meter input	Pull-up
31	I	METR	Rch meter input	Pull-up
32		VC5V	Power supply (+5V)	

Pin No.	I/O	Pin Name	Pin Description	Pin Processing
33	O	MTR0	LD motor, O/C motor selecting control, LD motor is selected when "H"	
34	O	MTR1	LD motor, O/C motor rotating direction control	
35	O	MTR2	LD motor, O/C motor rotating direction control	
36	O	MTR3	LD motor, O/C motor speed control, low speed when "H"	
37	I	KEY1	Key scan data input	Pull-up
38	I	KEY2	Key scan data input	Pull-up
39	I	KEY3	Key scan data input	Pull-up
40	I	KEY4	Key scan data input	Pull-up
41	I	SENSF	FWD side sensing pulse input	Pull-up
42	I	SENSR	REV side sensing pulse input	Pull-up
43	I	ENC0	Encoder input	Pull-up
44	I	ENC1	Encoder input	Pull-up
45	I	ENC2	Encoder input	Pull-up
46	I	ENC3	Encoder input	Pull-up
47	I	RESET	Reset pulse input, reset when "H"	
48	O	OSC2	Clock output	
49	I	OSC1	Clock input (4.19 MHz)	
50		GND	GND (0V)	
51	I	CL1		
52	O	CL2		
53	I	TEST		
54	O	MSP	O/C motor, middle speed control, middle speed when "H"	Pull-down
55	I	SW_F	SW_F input, ON when "L".	Pull-up
56	I	SW_L	SW_L input, ON when "L"	Pull-up
57	I	SW_M	SW_M input, ON when "L"	Pull-up
58	O	Sa (12)	Segment output, key scan output, and level scan output	Pull-down
59	O	Sb (11)	Segment output, key scan output, and level scan output	Pull-down
60	O	Sc (10)	Segment output, key scan output, and level scan output	Pull-down
61	O	Sd (9)	Segment output, key scan output, and level scan output	Pull-down
62	O	Se (8)	Segment output, key scan output, and level scan output	Pull-down
63	O	Sf (7)	Segment output, key scan output, and level scan output	Pull-down
64	O	Sg (6)	Segment output, key scan output, and level scan output	Pull-down

9.2 PD3153B OPERATION FLOW


Remote control interrupt
int1
remocon1
rtni
1.35 msec interrupt
timer b
remocon2
rtni
Key scan interrupt (6255 μ sec)
key scan
key scan
level scan
rtni
2 msec interrupt
timer a
sensing input
counter count
song input
changer sw encoder input
changer
remocon timer count up
main timer count up
rtni
Power off interrupt
int0
mute set
stop set
Display data generation
display
Soft timer count−up
count up
REC mute processing
SP mute
MS operation control
jump ms
Cassette mechanism, changer mechanism initialize
※ mcinit
Timer, test, demo SW input
※ switch
Changer mechanism operation control
changer
Cassette mechanism operation control
mechanism
Mute off processing
mute off
Remain, time counter counting
counter
Level meter analysis
meter
start
Port setting, RAM clear, timer setting, and interrupt setting
start up
10 msec ?
Port output
port out
Remote control key analysis
RM key
Key switch analysis
key in
Leader detection
leader
CD synchro, scan, all REW, random operation control
function
Relay operation control
relay
Tape end processing
tape end

※Only during initializing

POWER ON INITIALIZE

1. CPU Reset

The CPU is placed into the reset state by making the RESET terminal of the CPU "H" in level. When the power is ON, the resetting is made together with the Vcc of the CPU, and the level is brought "L" after Vcc has stabilized. As a result, the reset is released after that and the program starts.
In the reset state, all ports of the CPU become high impedance, and "L" and "H" of the ports are determined by the external circuit of the CPU.

2. Power ON Port Initialize

After the reset state has been released, all ports of the CPU are placed into the same mode as the mechanism is in the stopped state.

3. Power ON Mechanism Initialize

The CPU initializes the mechanism when turning the power on. This is done for stopping the mechanism. For this purpose, turn on the capstan motor for 1260 msec.
As the mechanism keeps the solenoid on during play. So, the mechanism can be put into the stopped state by initializing as explained above. After that, proceed with the initialization of the changer mechanism. (Refer to the appropriate section of "Changer Mechanism Control".)

4. Power ON Mask Time

The CPU does not accept any key−in operations, including remote control operation for a period of 4 to 10 seconds after power on (reset release) as there is a need to wait for the amplifier circuit of the deck to stabilize. During this time, the FL display alternately shows ▷▷▷▷ and ◁◁◁◁.
Note : The time till the end of initialization varies depending upon the changer mechanism condition.

POWER OFF PROCESSING

1. Power OFF Interrupt

When the power OFF terminal of the CPU is made "L" level, all operations are discontinued, and the power off processing is made. This is referred to as the "Power OFF Interrupt". This process has priority over any operations.
The power off pulse given to the CPU terminals detects that the power is turned off and it must be generated before Vcc of the CPU has fallen.

2. Power OFF Processing

In the above power off interrupt, the process is carried out as follows : First, the AMP system (line mute and REC mute) are closed (into the mute state), and the bias is turned off to cause PB SW to switch off. Protection such as noise prevention is made by holding noise when the power is off, or noise prevention on the tape. The mechanism is then placed into the stop state.

3. Power OFF Reset

The CPU is reset by the reset pulse after making the process above. Also, if the CPU is not reset or Vcc is in the steady state after power off processing, the CPU starts to make normal operation.

9.3 CHANGER MECHANISM CONTROL

1. Outline

The changer mechanism control consists of open/close job for controlling the tray open/close operation and the loading job for controlling the loading/unloading operation.
These jobs make control of each motor with the below-mentioned switch and encoder and performs subsequent operation.

2. SW and Encoder Input

(a) SW_F
This switch detects that the tray has been opened.

(b) SW_M
This is a switch for detecting the closing position. It has two protrusions which serve as the speed reducing points at the time of closing and unloading.

(c) SW_R
This switch detects that the drive plate has reached the last portion.

(d) SW_L
This switch detects that the carrier has reached the cassette mechanism position.

(e) CASE
This detects that the carrier has come into contact with the cassette holder when initializing.

(f) ENCORDER
This encoder is a 4 bit type for lateral control (LD motor).

(g) HALF SW
This makes detection of a cassette "half state" on the tray. It judges whether or not the loading operation can be made.

3. Motor Control

The loading motor and the open/close motor are controlled with four ports MTR 0 to 3. Both motors are driven by one driver, and the operations of these will never be made at the same time under any circumstances.

4. Loading Job

Cassette half loading on to the cassette mechanism is made from the tray, and its returning operation to the tray from the cassette mechanism are performed.

(a) Lateral Direction (LD Motor Control)
The carrier is operated by the loading motor. The carrier location is judged by the encoder.
Since the zone detection system is in use, when carrier has past the target position, the control is so made that the motor is reversed and that the carrier returns to its home position as a result. Also, the carrier is slowed down at a position just one before the target position so that it detects the zone and stops reliably. But no speed deceleration is made at the time of mechanism loading. Judgment of the mechanism position is based on the fact that the encoder is in the mechanism position and that SW_L is turned ON.

(b) Longitudinal Direction (O/C Motor Control)
The drive plate is operated by the open/close motor. Its locations are judged by SW_M and SW_R.
SW_M has two protrusions. Normally (in an unloading state), the drive plate stops at the rear protrusion position. The front protrusion serves as a speed decelerating point at the time of unloading. This front protrusion makes control such that the drive plate stops when the speed is slowed down at the ON → OFF edge of the front protrusion, and the drive plate stops when the rear protrusion has been turned on. At the time of loading, pull the drive plate backward until SW_R turns on.

5. Open/Close Job

Tray open/close operation is made.

(a) Open
Turn the open/close motor forward and the tray stops after SW_F has been turned on.

(b) Close
This operation varies depending upon whether or not the cassette half is in the cassette mechanism. When the cassette half is in it, pull the drive plate until SW_R can be turned ON. But when the cassette half is not in it, the control is by SW_M, and slow reversal is made at the ON → OFF edge of the rear protrusion. The motor stops when SW_M has been turned on once again.

6. Protection Function

The following protection functions are available for the motors and mechanical lock prevention :

(a) Emergency
In the loading job, if the operation is not completed even after an elapse of twenty seconds or more from motor rotation, this abnormality is judged an emergency, thereby causing the motor to stop. As a result, the loading operation is stopped, making no key-in to accept in any cases.
In the open/close job, the direction of motor rotation is reversed if the operation is not completed even after an elapse of 6 seconds from motor rotation. Further, if the operation is still not completed after another 6 seconds, this is judged an emergency. As a result, the motor is brought to a stop. In this case, however, key-in is accepted.

(b) Erroneous Insertion Prevention
To prevent erratic operation from occurring when the cassette half is inserted into the position of that cassette half on the tray, notwithstanding that the cassette half has already been loaded, the tray is opened and the loading/unloading operations are prevented from being made upon sensing that the same cassette half has been inserted in there.

7. Initialize

Initialize is made at the end of the cassette mechanism initialization with the power turned on. The status is judged by each changer mechanism SW, encoder, and pack sensing SW, either the loading, unloading, or tray open state is established. (Refer to Fig. 9-1 "Matrix") But initialize different from normal one must be done in the TIMER mode.
If the encoder is in the blank position during the TIMER mode of operation, it is judged the power OFF condition in the middle of the position toward the next cassette half after unloading. So, the loading of the cassette half next to that blank is made. Also, if it is not the blank position, that cassette half is loaded.
With the foregoing operation, data of the encoder at that time is kept in memory following the cassette mechanism initialization.

ENC	SW_L	PACK	SW_R	SW_M	SW_F	Process-ing
0	○	○	○			①
↓	○	○		○		②
↓	○	○			○	②
↓	○	○	–	–	–	②
↓	○	×	○			③
↓	○	×		○		③
↓	○	×			○	⑤
↓	○	×	–	–	–	②
≠BLANK			○			⑥
↓				○		④
↓					○	②
↓			–	–	–	②
BLANK			○			⑥
↓			–	–	–	⑦

Fig. 9-1. Changer Mechanism Initialize Matrix

(a) **Initialize Process Contents**

①Case check

When a cassette half has already been loaded at the time of power on, check that how many halves there are before here.

[Operation]
When the pack presence is sensed, the LD motor should be turned to move the carrier leftward. There is a case switch on the carrier. The design is therefore made so that the case switch is turned on when it has come into contact with the cassette holder. Now, judgment is made just which cassette half it is based on the encoder data when the case switch has been turned on.

②Judgment is made once again after turning on SW_R.

If no switch is turned on, the pack is present, but if the SW_R is not on, pull the drive plate backward until SW_R is turned on. And then perform judgment according to the matrix once again.

[Operation]
Stop when SW_R turns on after rotating O/C motor backward.

③SW_M initialize

When SW_M is turned on, it is not possible to determine whether the protrusion is the front one or the rear one. So, initialize SW_M once again to select the normal position (the rear protrusion). Also, when there is no pack and SW_R is on, initialize SW_M to turn on it.

[Operation]
Turn the O/C motor backward. When SW_R is turned on, reverse the motor rotation and then slow it down at the ON → OFF edge of the front protrusion. Stop the motor when the rear protrusion has been turned on.
If SW_R is on, rotate the O/C motor forward and then slow it down at the ON → OFF edge of the front protrusion. Stop the motor when the rear protrusion has been turned on.

④Move the carrier to the mechanism position after initializing SW_M.

When the carrier is not in the cassette mechanism position, it is necessary to move it back to the cassette mechanism position. But when SW_M is not in the normal position (the rear protrusion), the carrier cannot be moved. So, move the carrier back to the cassette mechanism position after setting SW_M to the normal position by initializing SW_M.

[Operation]
Turn the LD motor to move the carrier rightward after operation of ③. Then stop when SW_L turns on.

⑤Open state setting

Now, the open completed state is established. So, hold this condition as it is.

⑥Move the carrier to the cassette mechanism position and check the case.

When the carrier is in the blank position, it is necessary to move the carrier back to the cassette mechanism position. The state in which the carrier is in the blank position, and in which SW_R is on indicates that the carrier is being moved by loading and unloading. After moving it back to the cassette mechanism position, the case check should be made.

[Operation]
When SW_L is turned on after rotating the LD motor and moving the carrier rightward, the operation of ① is made.

⑦Move the carrier to the cassette mechanism position and initialize SW_M.

When the carrier is in the blank position, it is necessary to move it back to the cassette mechanism position. The state in which the carrier is in the blank position and in which SW_R is off indicates that the carrier is being moved by loading. After moving it back to the cassette mechanism position, and initialize SW_M to move SW_M to the normal position (the rear protrusion).

[Operation]
When the SW_L is turned on after rotating the LD motor and moving the carrier rightward, the operation of ③ is mode.

8. Encoder Input

Carrier position control is made by the encoder. Using a 4 bit rotary encoder, input is made on ports ENC 0 to 3 at very 2 msec, and the data coincided two times is converted into HEX code. The encode patterns are gray code, and it represent the absolute positions when converted into HEX code. So, when the current position is known, the direction of rotation is automatically determined.

POSITION	ENCODE PATTERN				HEX		
	ENC3	ENC2	ENC1	ENC0	INPUT	XINPUT	DECODE
BLANK	1	1	1	0	E	1	D
MECHA	1	1	1	1	F	0	0
BLANK	1	1	0	1	D	2	1
HALF6	1	0	0	1	9	6	2
BLANK	1	0	0	0	8	7	3
HALF5	1	0	1	0	A	5	4
BLANK	1	0	1	1	B	4	5
HALF4	0	0	1	1	3	C	6
BLANK	0	0	0	1	1	E	7
HALF3	0	1	0	1	5	A	8
BLANK	0	1	1	1	7	8	9
HALF2	0	1	1	0	6	9	A
BLANK	0	1	0	0	4	B	B
HALF1	1	1	0	0	C	3	C
BLANK	1	1	1	0	E	1	D

Fig. 9-2. Encoder Pattern

9.4 ALL REW

Perform REW operation starting with the cassette half with the smallest number and rewind all halves.

[Acceptance Conditions]

①The mode is neither the REC mode nor the function mode.

②One or more cassette halves should be available. (When the tray is open, judgment should be made after closing the tray).

[Operation]

When no cassette half is loaded, perform REW operation after loading the one with the smallest number. If a cassette half is already loaded, unload the half and then load the cassette half with the smallest number to perform REW operation.
During operation the unit enters the RELAY mode.
The RELAY mode is released at the end of operation.

[Display]

The RELAY indicator lights, and the "ALL" indicator appears in the 4-digit counter.

[Release]

①If effective key-in is performed during operation, operation stops, the RELAY mode is released, and the keyed-in operation should be performed.

Note :If key-in is performed during unloading operation, the keyed-in operation should be made after loading the next cassette half since it is already in loading assist operation.

②If the RELAY mode is released during operation by RELAY key input, the ALL REW mode is released as well.

Note1 : If RELAY key-in is performed during REW operation, the ALL REW mode is released, and the REW operation continues.

Note2 : If RELAY key-in is performed during unloading operation, the REW operation is performed after loading the next cassette half since it is already in loading assist operation.

9.5 CASSETTE SCAN

The forward play of Cassette halves are done sequentially 10 sec each as from the youngest numbered one.

[Acceptance Conditions]
①The operating mode is neither the REC mode nor function mode.
②One or more cassette half is in existence. (When the tray is open, judgment must be made after closing the tray.)

[Operation]
If no cassette half is loaded on, the youngest numbered one should be loaded to start the FWD PLAY. If a cassette half is already loaded, such a half should be unloaded, and the youngest numbered half should be loaded to start the FWD PLAY. During operation, the mode becomes the RELAY mode. The RELAY mode is released at the end. The equipment goes into the MS operation if there is a blank period of 15 seconds before starting the playback.

[Display]
The RELAY IND lights, and the "SCAN" IND then lights at the 4–digit counter section.

[Release]
①If effective key–in is made during operation, the operation is stopped, and the RELAY mode is released, and the key–in operation entered is performed.

Note :When there is key–in during unloading, key–in operation of the one input after loading the cassette half should be made because the loading assist operation for the next cassette half is already in progress.

②Make relay key–in during operation to clear the RELAY mode. When this is done, the CASSETTE SCAN mode can be released.

Note1 : When the relay key–in is made during the FWD PLAY, the CASSETTE SCAN mode is cleaned, but the FWD PLAY operation continues.

Note2 : If there is the relay key–in during the unloading operation, it indicates that the next cassette half is already in loading assist operation. So, the FWD PLAY operation is made after loading the cassette half.

9.6 CASSETTE RANDOM PLAY

Select the cassette half at random and make playback. To do playback, select the next cassette half after playback of one program and perform the playback of another program. Repeat this procedure afterwards.

[Acceptance Conditions]
①The mode is neither the REC mode nor the FUNCTION mode.
②Two or more cassette halves must be available. (When the tray is open, judgment should be made after closing the tray.)

[Operation]
Each cassette half first starts the playback from the FWD direction. After that, as the direction of each cassette half is kept in memory, playback is made accordingly.
If there is a blank period of 15 seconds after starting the playback, the equipment goes into the MS operation. Also, if there is a blank period of 3 seconds during playback, it should be judged as being between programs and the next cassette half should then be selected. When all the cassette halves come to the tape end, the operation is terminated. The last cassette half makes normal playback.
Note : The RELAY mode is released during operation.

[Display]
The RANDOM IND lights, [1] to [6] indicators sequentially light during the cassette half selection, and the cassette half number only lights after cassette half decision.

[Release]
①When there is effective key–in during the operation, stop the operation and the keyed–in operation should be made.

Note :If there is key–in during the unloading operation, it indicates that the next cassette half is already in loading assist operation. So, the keyed–in operation is made after loading the cassette half.

9.7 ADDITIONAL FUNCTIONS

1. TEST1 Mode (Sc. KEY3 Short)

A cassette mechanism check and changer mechanism status monitor are performed. When the power is on, the initialization of the cassette mechanism only is made, to put the 1st cassette half into the loading condition.
On the monitor of the changer mechanism, the status of SW_F, SW_M, SW_R and encoder is displayed. The cassette mechanism can be placed in the normal operation.

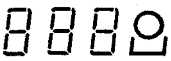
Note : There is no guarantee for the changer mechanism. So, do not operate the changer operation.

2. TEST2 Mode (Sc, KEY4 Short)

The changer mechanism motor (O/C motor and LD motor) can be manually operated. This is the mode of resetting when the changer mechanism is locked. When the power is on, only the cassette mechanism is initialized. No changer mechanism initialization is made. But the monitor display is made, just as in the case of TEST1 mode.
These five accepting keys only are available :

FF KEY : Move the carrier rightward
REW KEY : Move the carrier leftward
FWD KEY : Move the tray forward
REV KEY : Move the tray backward
STOP KEY : Stop the motor

Monitor indication in the TEST1 and 2.



SW_R, M, F ENCORDER

8 when SW ON Turned off when OFF

3. Changer Mechanism Check Mode (Se, KEY2 Short)

Changer mechanism check and aging are performed. For motor protection, the motor should be forcedly stopped if the loading assist operation is not completed in 10 sec. At that time, it is possible to determine just where motor has been stopped based on the number of steps being displayed.
The check mode can be released by using the STOP key.

Display	Operation
S−1	Open
S−2	Close to 1st load
S−3	1st unload to 2nd load
S−4	2nd unload to 3rd load
S−5	3rd unload to 4th load
S−6	4th unload to 5th load
S−7	5th unload to 6th load
S−8	6th unload to 5th load
S−9	5th unload to 4th load
S−A	4th unload to 3rd load
S−B	3rd unload to 2nd load
S−C	2nd unload to 1st load
S−D	1st unload
S−E	Open
S−F	Close

Fig. 9−3

4. Skeleton Model Protection (Sa, KEY4 Short)

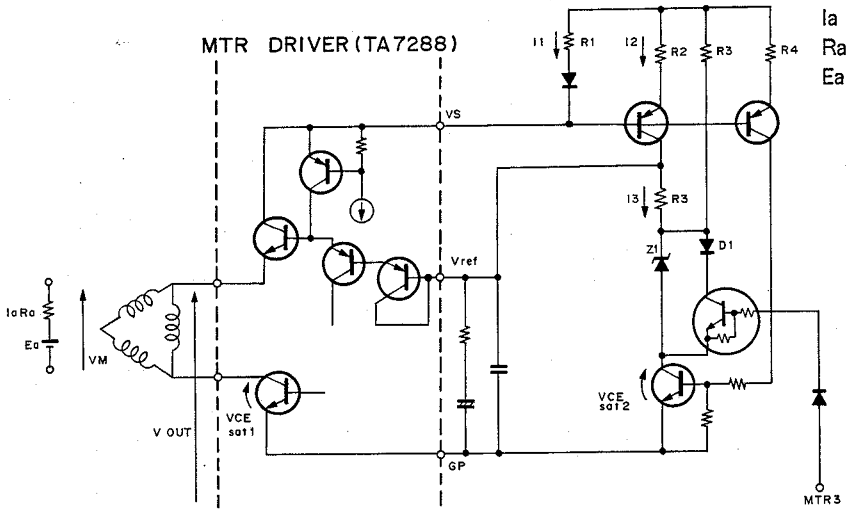
In the protection mode, the OPEN key is not accepted so as to avoid tape stealing at retail stores, but all the other is the normal operation. But when the power is on and the STOP key is kept on pressing, the protection mode is released so that the open key is accepted.

5. DEMO Mode

There is the 20−sec playback cassette random play mode is available as the DEMO mode. This mode can be selected by multiple pressing. Major differences of it from the cassette random play mode are that playback is for 20 seconds instead of one program playback and that the play is not terminated unless stopped by key−in operation.

①Select the TIMER PLAY mode.
②Select the ⊂⊃ mode.
③Press the MUTE key and the REW key.
④Let go the MUTE key while holding the REW key.
⑤Let go the REW key.

9.8 O/C MOTOR AND LD MOTOR SPEED CONTROL CIRCUITS



Ia : Motor winding current.
Ra : Motor winding resistance.
Ea : Motor winding counterelectromotive force

Fig. 9−4

From IC data, the following relations are known.

$V_{OUT} = V_{ref} + 0.7V = V_{ref} + V_{BE}$ ························ (1)

So, when the internal circuit is assumed, the result appears as shown in Fig. 9−4.

This speed control circuit is designed to be $V_Z \fallingdotseq E_a$. That is, the motor rotation speed is roughly determined by the Zener voltage. Therefore, the theoretical equation is as given below.

$V_{OUT} = V_M + V_{CEsat1}$

$\quad = I_aR_a + E_a + V_{CEsat1}$ ······························ (2)

$V_{ref} = R_3I_3 + V_{Z1} + V_{CEsat2}$ ······························ (3)

$I_2 = R_1/R_2I_1 = ※KI_1$ ······························ (4)

※K=Mirror ratio

$I_1 \fallingdotseq I_a$ ······································ (5)

$I_2 \fallingdotseq I_3$ ······································ (6)

From equations (4), (5), and (6)

$I_3 \fallingdotseq KI_a$ ······································ (7)

Substituting the equation (1) with the equation (2), then,

$I_aR_a + E_a + V_{CEsat1} = V_{ref} + V_{BE}$ ························ (8)

Substituting the equation (8) with the equation (3),

$I_aR_a + E_a + V_{CEsat1} = R_3I_3 + V_{Z1} + V_{CEsat2} + V_{BE}$

$E_a = R_3I_3 - I_aR_a + V_{Z1} + V_{CEsat2} - V_{CEsat1} + V_{BE}$ ···················· (9)

And substituting the equation (9) with the equation (7),

$E_a \fallingdotseq V_Z + V_{CEsat2} + V_{BE} - V_{CEsat1} - (R_a - KR_3)\, I_a$ ···················(10)

In the equation (10), assuming that V_{CEsat2}, V_{CEsat1} and V_{BE} are nearly constant, then the motor speed can be determined based on the Zener voltage in the first rule if the mirror ratio and R_3 are decided to be $R_a = KR_3$.

Speed Change

Z_1 is Zener diode for high speed setting and D_1 is diode for low speed setting.

When the microcomputer output, MTR3 are all "L", V_{Z1} is applied to the Vref pin of the driver IC along with the voltage drop $I_3 : R_3$ of the current detecting resistor R_3. And when MTR3 are "H", $2V_F$ voltage of D_1 is applied, respectively.

10. MECHANISM DESCRIPTIONS

DESCRIPTION OF CHANGER MECHANISM

The operation of the changer mechanism unit basically consists of a combination of the forward and backward operations of the tray section with respect to the front panel of the product and the lateral operation of the carrier section.

Tray Closing Operation

When the voltage is applied to the motor in such a way that the motor is rotated clockwise as seen from the rear of the bottom chassis, the motor rotation is sequentially transmitted to the motor pulley ①, O/C belt ②, pulley gear ③, interval gear ④, drive gear A ⑤, rack plate ⑥, and drive gear B ⑦, thereby causing the drive plate B ⑲ to be engaged with the drive gear B to be driven. (See Fig—1)

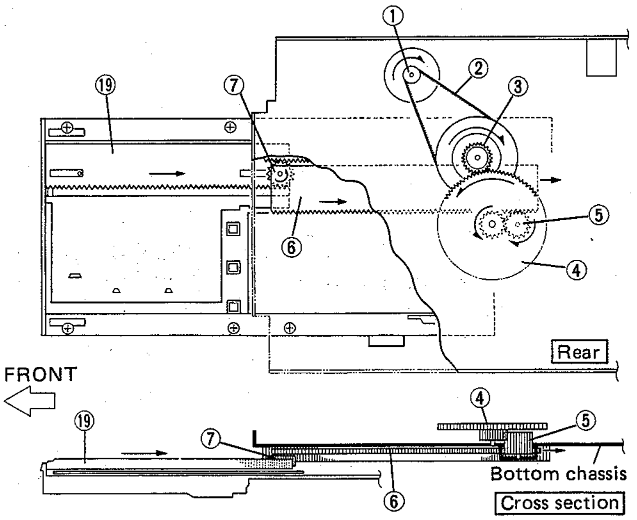

①
②
③
⑲
⑦
⑥
⑤
④
Rear
FRONT
⑲
⑦
④
⑤
Bottom chassis
⑥
Cross section

Fig.—1

Next, as shown in Fig—2, the drive plate B ⑲ pushes the ball A ⑱ and the ball A ⑱ which now have no place to escape drives the side rail R ⑯ in that condition. Since the side rail R ⑯ is assembled integrally with the tray base ⑮, the tray entirety operates in the closing direction. Then, the tray moves to the position where the rear bent side of the tray base ⑮ comes into contact with the stopper of the bottom chassis. After going past the load plate ⑬, at a position somewhat before it comes into contact with the stopper, the ball A ⑱ moves underneath at the concave portion A ⑭ of the bottom chassis. The drive force of the tray section has been detached at that time, and the protrusion ㉑ of the lower side of the drive plate B ⑲ only moves to the position where the SW lever ⑪ of the bottom chassis is turned on.

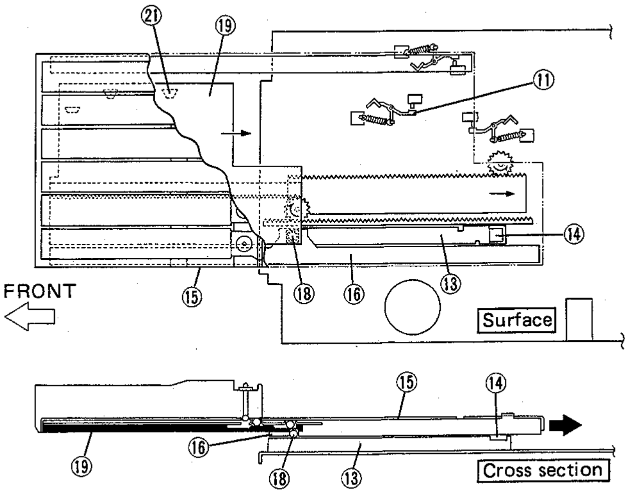

㉑
⑲
⑪
⑭
FRONT
⑮
⑱
⑯
⑬
Surface
⑮
⑭
⑯
⑲
⑱
⑬
Cross section

Fig.—2

Tray Opening Operation

The opening operation of the tray is just the reverse of the closing operation. First, the drive plate B ⑲ begins to move forward, causing the ball A ⑱ provided at the concave section A ⑭ to be pushed by the inclined side of the load plate ⑬ in the upper direction as shown in Fig—3. And the ball A ⑱ is pushed into the concave section B of the drive plate B ⑲. Now, the ball A ⑱ drives the side rail R ⑯ and the tray base ⑮. The tray section moves to the position where the protrusion ㉓ located at the lower part of the side rail L ⑰ causes the SW lever ⑩ to be turned on.

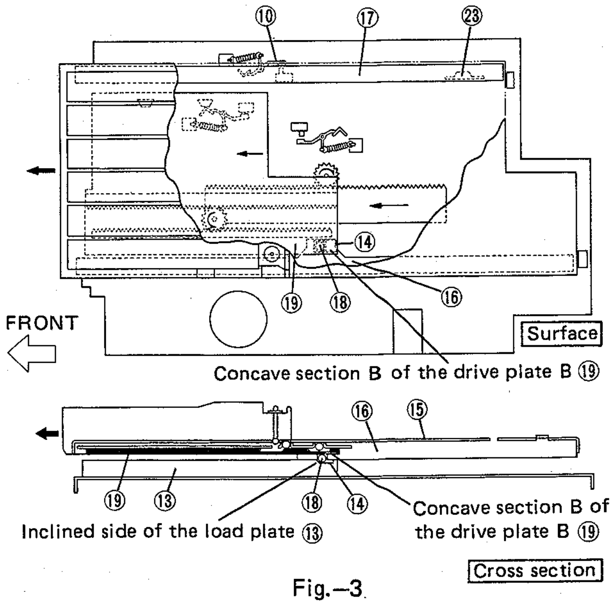

⑩
⑰
㉓
⑭
⑯
⑲
⑱
FRONT
Surface
Concave section B of the drive plate B ⑲
⑯
⑮
⑲
⑬
⑱
⑭
Concave section B of the drive plate B ⑲
Inclined side of the load plate ⑬
Cross section

Fig.—3

ON Operation of First Cassette Key (From the Tray Open State)

The operation from the tray open position to the close position is the same as described above. When the tray has moved to the close position (the SW lever ⑪ is turned on), the carrier section moves to the 1st cassette position from the cassette mechanism mounting position. The selector ㉕ is mounted in the carrier ㉔. Along with the movement of the carrier ㉔, the selector ㉕ moves to the first one of the cassette while sequentially pushing the head of the stopper pin ㊲. In this case, the location of position 6 of 1st cassette through 6th cassette can be electrically detected by the encoder ㉞ mounted on the carrier ㉔. The cassette mechanism mounted location can be detected by the microswitch ㊷ mounted on the carrier ㉔. (Fig−4)

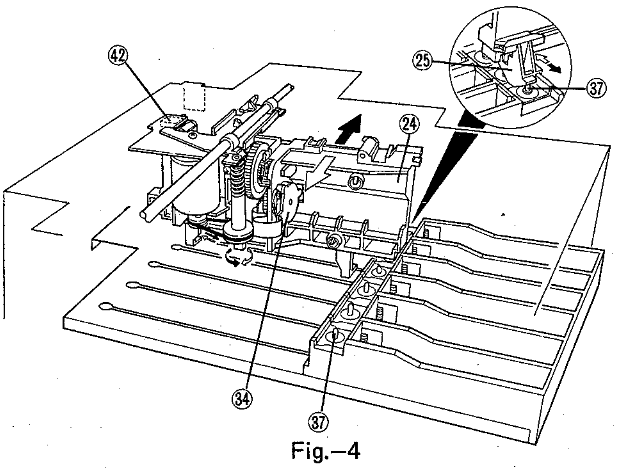


Fig.–4

Next, the voltage is applied to the motor, and the drive plate B ⑲ is further moved backward. After moving several millimeters, the ball B ㊸ is putted against the inclined side of the drive plate B ⑲, to drive the drive plate A ⑳ as shown in Fig−5. The cassette holder ㊱ mounted on the tray base ⑮ is normally locked by the stopper pin ㊲, but it is unlocked when the stopper pin ㊲ is pushed down by the selector ㉕. For this reason, the cassette holder ㊱ of the first cassette is already unlocked when the carrier ㉔ moved to the first cassette, and the tip−end of the stopper pin㊲ lowered to the position where it comes into engagement with the hole a of the drive plate A ⑳. Therefore, the drive force of the drive plate B ⑲ is transmitted to the ball B ㊸, drive plate A ⑳, stopper pin ㊲, and cassette holder ㊱ in the order mentioned. The cassette half (cassette holder ㊱) and the selector ㉕ simultaneously move backward together with the movement of the drive plate A ⑳, and the cassette half now comes into the carrier section ㉔. The drive plate A ⑳ moves to the position where it comes into contact with the bent side of the tray base ⑮. (Fig−6)

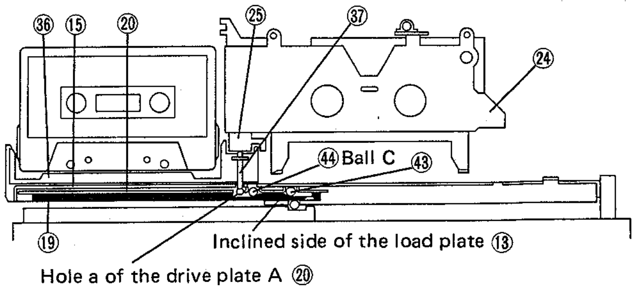

㊱
⑮
⑳
㉕
㊲
㉔
㊹Ball C
㊸
⑲
Inclined side of the load plate ⑬
Hole a of the drive plate A ⑳

Fig.–5

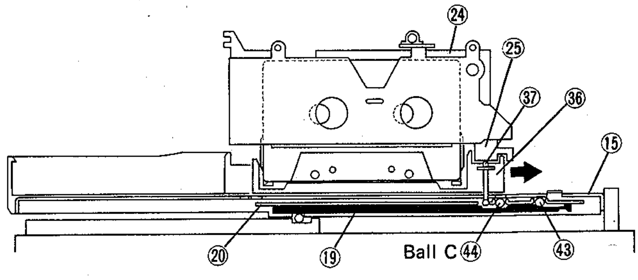


Fig.–6

The ball B ㊸ is lifted toward the concave section A ㊳ of the tray base ⑮ slightly before the above contact with the bent side takes place as shown in Fig−7. So, the drive plates A ⑳ and B ⑲ are disengaged from each other. The drive plate B ⑲ moves to the position where the protrusion ㉒ provided at the lower section causes the SW lever ⑫ of the bottom chassis to be turned on. (Fig−8)

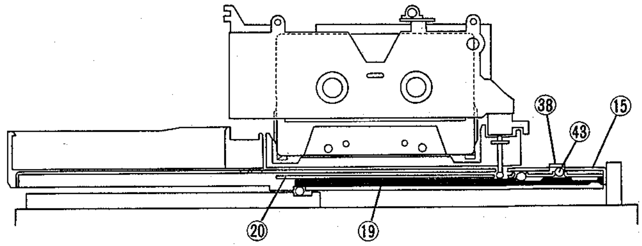


Fig.–7

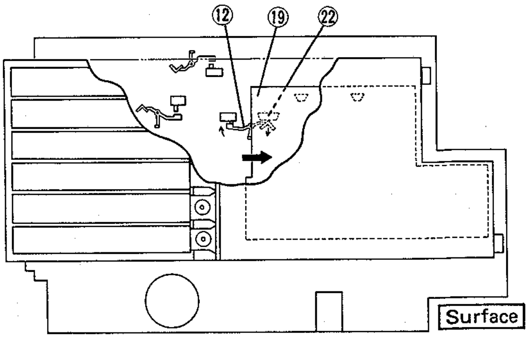


Fig.–8

Then, the carrier ㉔ moves to the cassette mechanism mounting position (where the microswitch ㊺ is turned on). In the mechanism mounting position, the cassette half is pressed to the carrier ㉔ by means of cassette pressure devices A, B ㊵. (Fig−9) Because the tray can be opened with the cassette half mounted in. In this case, the stopper arm ㊶ attached to the side of the cassette holder ㊱ under pressure of a spring rotates as shown in Fig−10 because the cassette holder ㊱ has already been moved to the back of the tray base ⑮ in the case of the tray for the first cassette. In this condition, the cassette half cannot be inserted in the first one as the cassette half is tilted, and the cassette does not come into the product in spite of tray closing operation, and does not be closed.

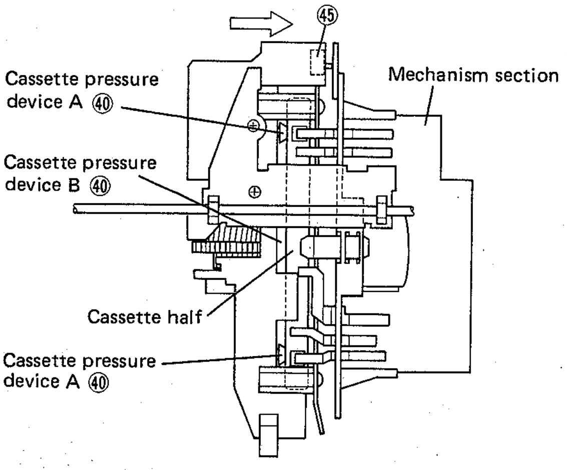

㊺
Cassette pressure device A ㊵
Mechanism section
Cassette pressure device B ㊵
Cassette half
Cassette pressure device A ㊵

Fig.−9

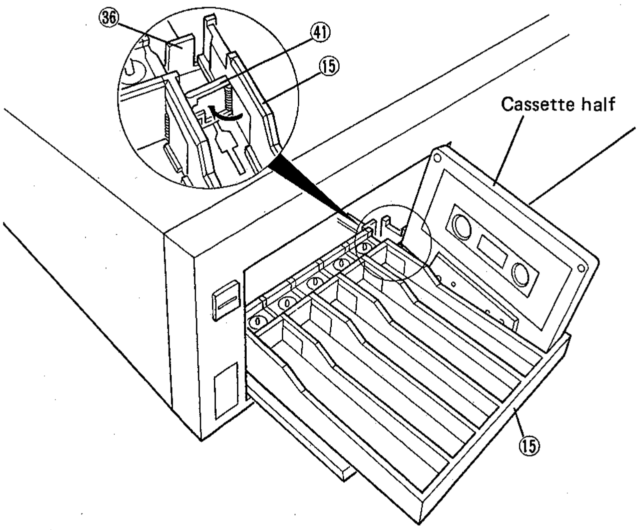


Fig.−10

Cassette Return Key ON Operation (1st Cassette Mechanism Mounted Condition)

First, the carrier section ㉔ moves to the 1st cassette position, which is just the reverse of the process in the cassette loading operation.
Next, the drive plate B ⑲ is driven in the forward direction. The selector ㉕ that has been moved to the back of the carrier ㉔ at that time comes into the cassette holder ㊱ while pushing the stopper pin ㊲ of the cassette holder ㊱. The tray base ⑮ is unlocked when pushed down by the stopper pin ㊲, to allow engagement with the drive plate A ⑳. (Fig−11)
Next, the drive plate B ⑲ is driven in the forward direction, the drive plate A ⑳ also begins to move forward as the ball comes into contact with the inclined side after moving several millimeters. Just as in the case of the cassette loading operation, the drive force is sequentially transmitted to the drive plate A ⑳, stopper pin ㊲, cassette holder ㊱, and selector ㉕. So, the cassette half and selector ㉕ moves toward the tray base ⑮. The drive plate A ⑳ moves until it come into contact with the bent side at the front area of the tray base ⑮. The ball is lifted to the recessed section B ㊴ of the tray base ⑮ slightly before it comes into contact with the tray base ⑮, the drive plates A ⑳ and B ⑲ are disengaged from each other. The drive plate B ⑲ moves to the position where the protrusion ㉑ of the lower section causes the SW lever ⑪ of the bottom chassis to be turned on.

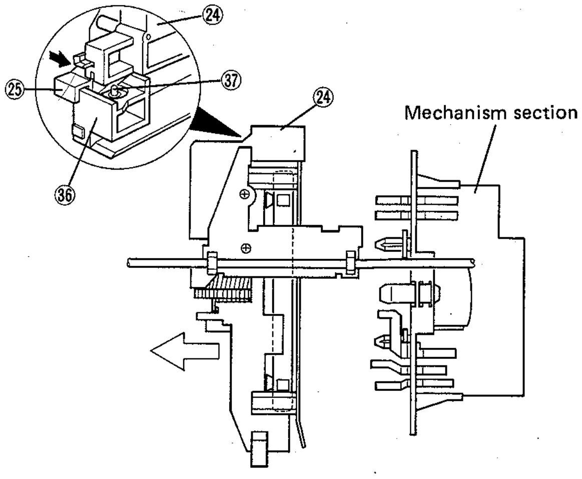


Fig.−11

Cassette Direct Change (2nd Cassette Key ON in the 1st Cassette Mounted State)

This operation is a combination of the afore-mentioned cassette loading operation and the cassette return operation.

11. DISASSEMBLY

REMOVAL OF LOADING UNIT (Refer to Fig–1.)

1. Remove seven screws ①, and remove the front panel assembly.
2. Remove six screws ② and cords, etc., and remove the loading unit.

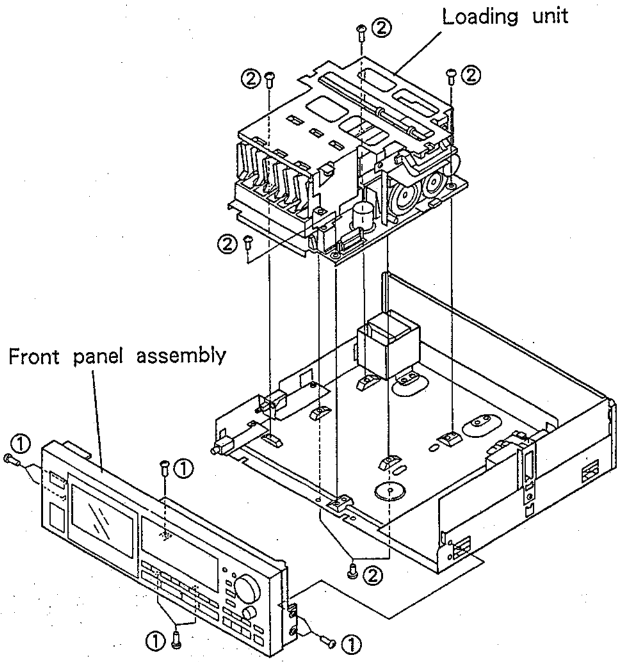

Loading unit
②
②
②
②
Front panel assembly
①
①
②
①
①

Fig.–1

REMOVAL OF MECHANISM UNIT (Refer to Fig–2.)

1. Remove two screws ① and two screws ②, and remove the mechanism unit while lifting the lower section up.

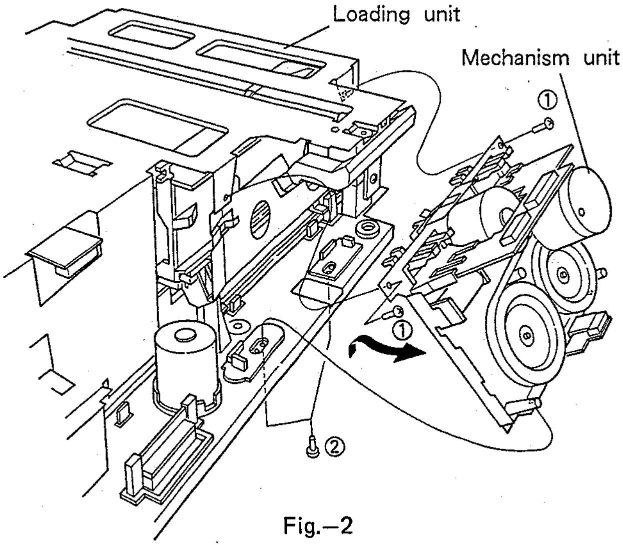

Loading unit
Mechanism unit
①
①
②

Fig.–2

Precautions on Installation

- When installing, lift the head base of the mechanism unit by fingers as shown in Fig–3 Ⓐ, and insert the mechanism unit slanting to upper. (Refer to Fig–8.)

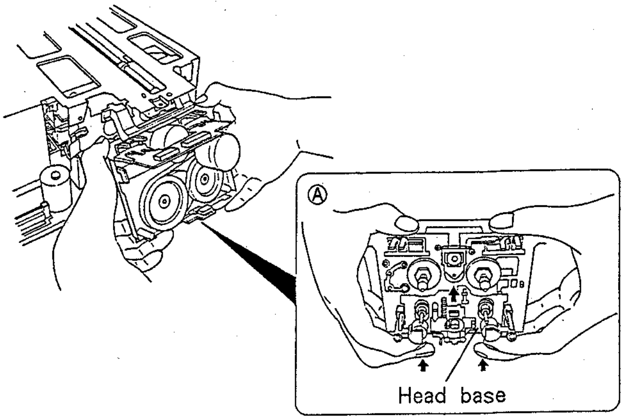


Fig.–3

REMOVAL OF TRAY ASSEMBLY (Refer to Fig–4.)

1. After checking that the carrier is pressed on the mechanism unit, turn the interval gear on the back of the loading unit clockwise and draw the tray assembly. While slanting the hook Ⓐ with fingers in the direction of arrow, draw the tray assembly again so that the hook Ⓐ is onto the stopper of the tray assembly. With this state, the tray assembly is removed, if draw it with pushing the hook Ⓑ on the opposite side of hook Ⓐ by slotted screwdriver, tweezers, etc.

Note : Be careful not to lose the ball Ⓐ as it falls when the tray assembly is pulled out.

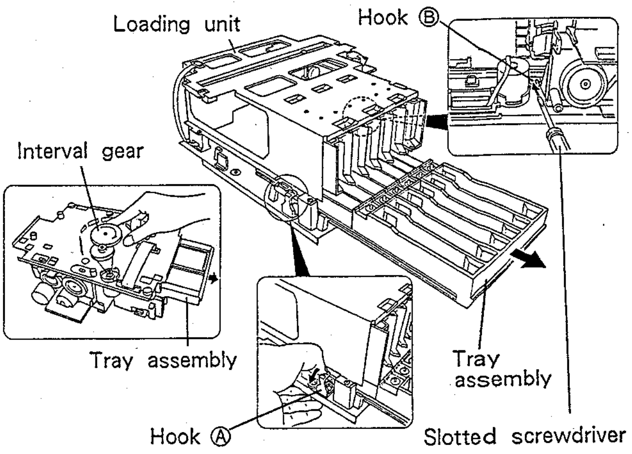

Loading unit
Hook Ⓑ
Interval gear
Tray assembly
Tray assembly
Hook Ⓐ
Slotted screwdriver

Fig.–4

REMOVAL OF DRIVE PLATE A AND B, CASSETTE HOLDER, STOPPER ARM AND TRAY

1. Remove two screws ① and two screws (1-a) (① longer than (1-a)), and remove the side rail R. And remove the drive plate A and B. (At this time, be careful not to loose the ball B and C as they fall.) Insert the slotted screwdriver between A and B of the drive plates as shown in Fig–5, and remove the hooks by pushing the drive plate B in the direction of arrow ⓐ, then remove the drive plate B as shown in Fig–5 Ⓐ.

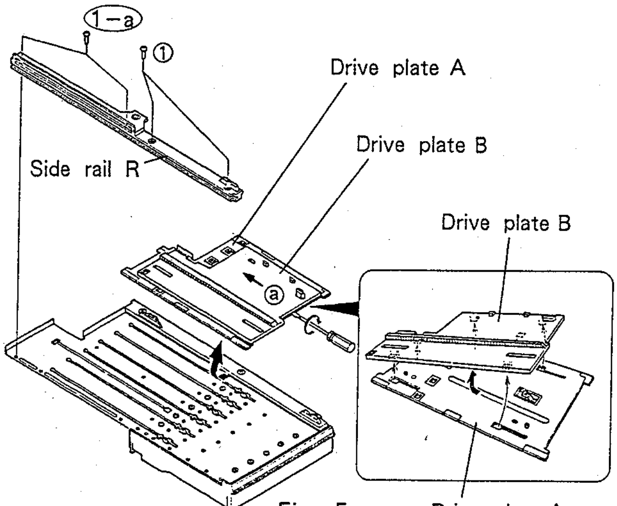

(1-a)
①
Drive plate A
Drive plate B
Side rail R
Drive plate B
ⓐ
Ⓐ
Drive plate A

Fig.–5

2. Remove two screws ① and two screws (1-a), and remove the side rail L. While lowering the stopper pin with fingers, move all the cassette holders backward. Remove 10 screws ③, and remove the tray and stopper arms. (Refer to Fig–6.)

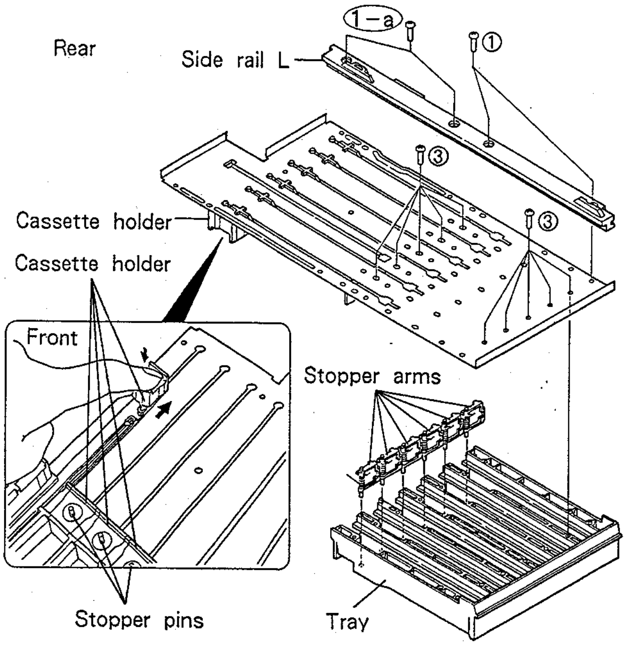

Rear
Side rail L
(1-a)
①
③
③
Cassette holder
Cassette holder
Front
Stopper arms
Stopper pins
Tray

Fig.–6

3. While pressing the stopper pin, remove the cassette holders by moving it forward. (Refer to Fig–7.)

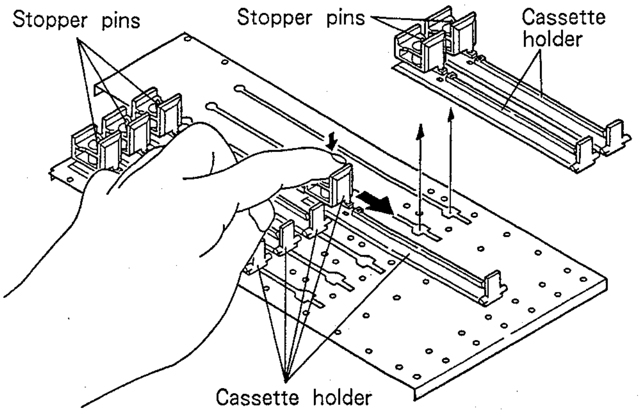

Stopper pins
Stopper pins
Cassette holder
Cassette holder

Fig.–7

Precautions on Installation

- When installing the stopper arms, hook the edge of the spring on the notch as shown in Fig–8 Ⓐ. And insert the longer shaft to the tray. This provides easy installation of the tray and tray base. When installing the tray and tray base, be sure that all bosses fit to respective holes and that the screw holes are not onto the tray base as shown in Fig–8 Ⓑ. Remove the springs of the stop arms from the notches by tweezers, etc. as shown in Fig–9. And press the stopper pins with finger so that all the cassette holders move forward.
- Be sure to install the balls A to C when installing the drive plate A and B, or the tray assembly.

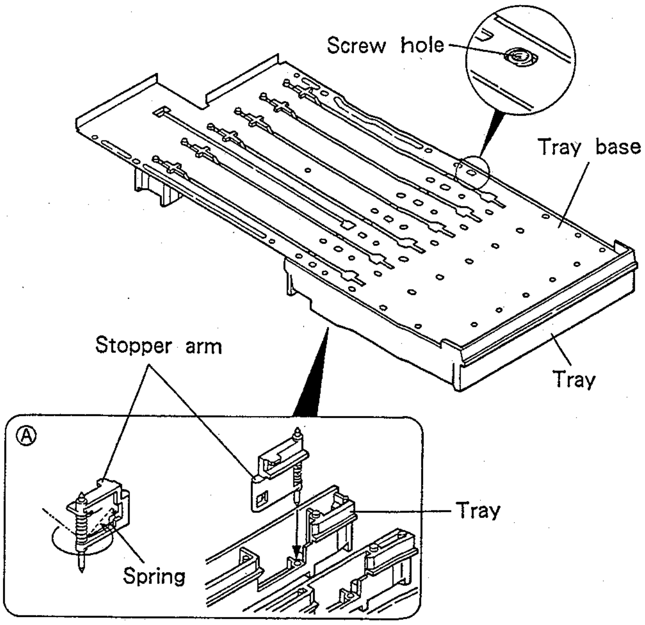

Screw hole
Tray base
Tray
Stopper arm
Ⓐ
Tray
Spring

Fig.–8

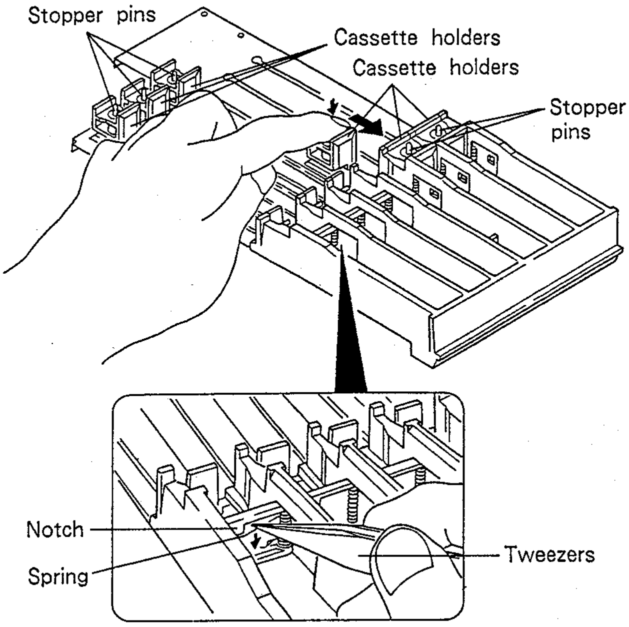

Stopper pins
Cassette holders
Cassette holders
Stopper pins
Notch
Spring
Tweezers

Fig.–9

REMOVAL OF UPPER CHASSIS (Refer to Fig–10.)

1. Since the carrier is pressed on the mechanism unit, turn the worm pulley with finger in the direction of arrow ⓐ to the position where the carrier plate of the carrier does not come into contact with the reel of the mechanism unit.
2. Remove four screws ① and two screws ②, and remove the upper chassis.

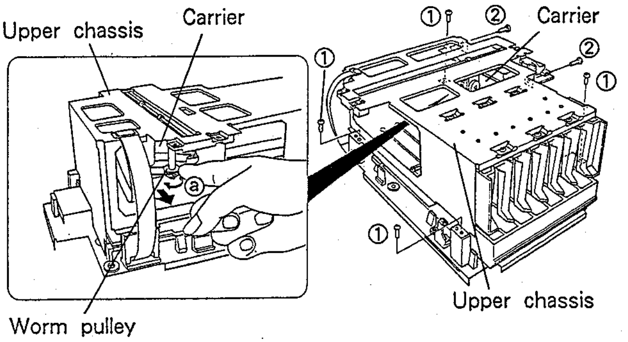

Upper chassis
Carrier
①
②
Carrier
②
①
①
ⓐ
①
Upper chassis
Worm pulley

Fig.–10

REMOVAL OF CARRIER, ENCODER, ENCODER GEAR, DRIVE BELT, MOTOR AND LOADING GEAR

1. Remove the lead card from the connector, and remove the screw ①. And remove the carrier with guide shaft from the removed screw side. (Refer to Fig–11.)

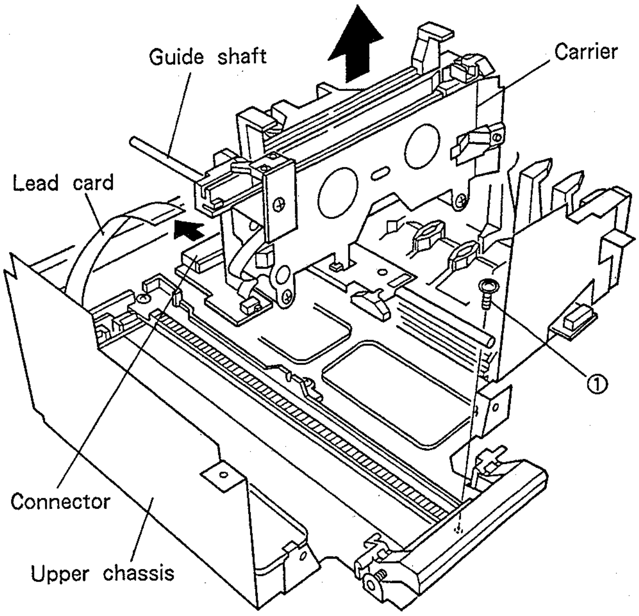

Guide shaft
Carrier
Lead card
①
Connector
Upper chassis

Fig.–11

2. Remove the screw ②, and remove the encoder by turning it clockwise. With this state, the encoder gear also can be removed. (Refer to Fig–12.)

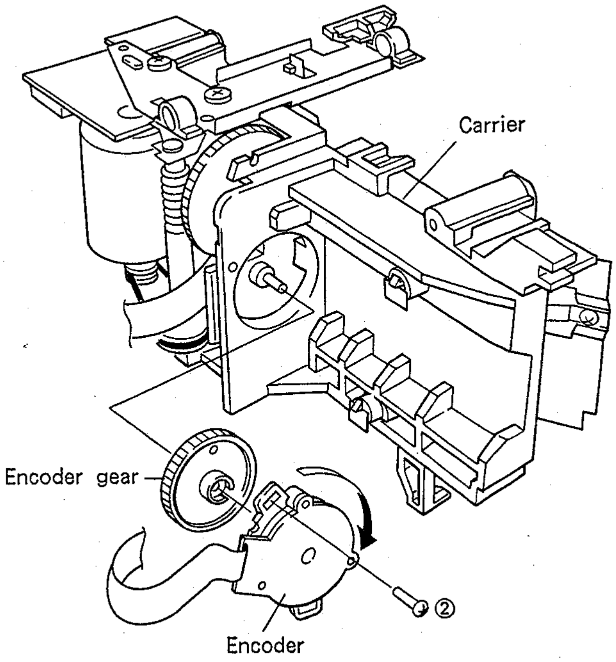

Carrier
Encoder gear
②
Encoder

Fig.–12

3. Remove the drive belt from the motor pulley, and remove three screws ③, and then remove the carrier plate. (Refer to Fig−13.)

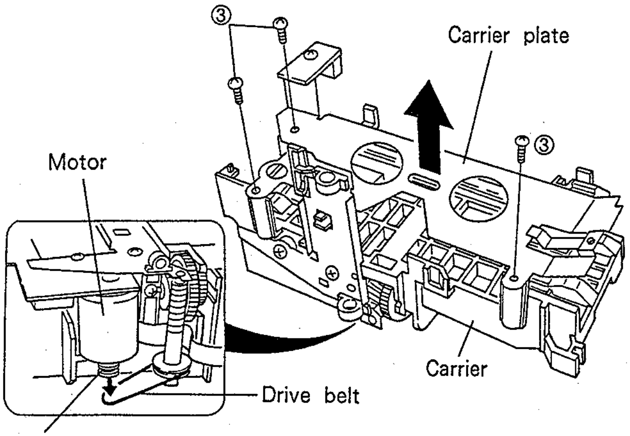

③
Carrier plate
③
Motor
Carrier
Drive belt
Motor pulley

Fig.−13

4. Remove two screws ④, and remove the carrier slider. And the drive belt can be removed by removing the worm pulley. (Be careful not to stain the drive belt with grease at this time.) (Refer to Fig−14.)

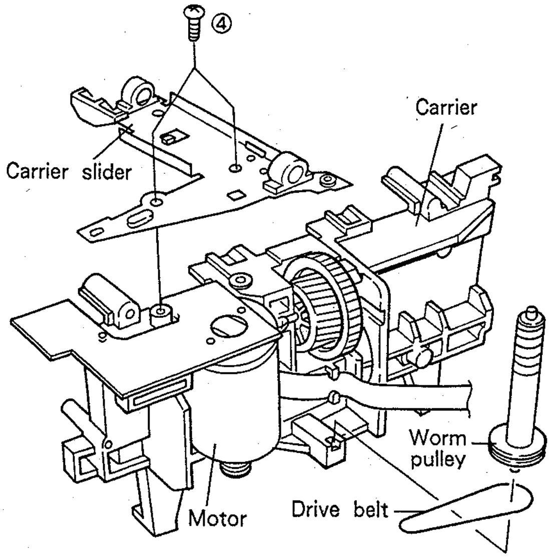

④
Carrier
Carrier slider
Worm pulley
Motor
Drive belt

Fig.−14

5. Remove two screws ⑤ and desolder two sections (Fig−15 Ⓐ), and remove the motor. (Refer to Fig−15.)

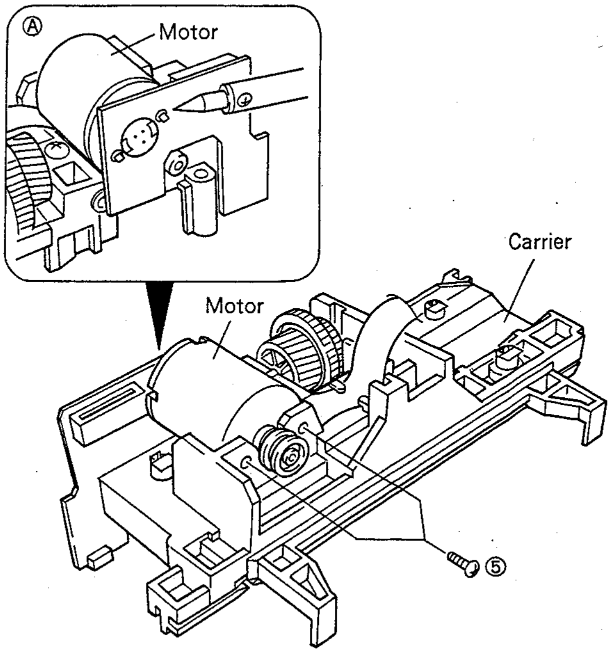

Ⓐ
Motor
Carrier
Motor
⑤

Fig.−15

6. Remove the screw ⑥, and remove the loading gear after pulling out the loading shaft with a pliers by pushing the upper of the loading gear with fingers. (Refer to Fig−16.)

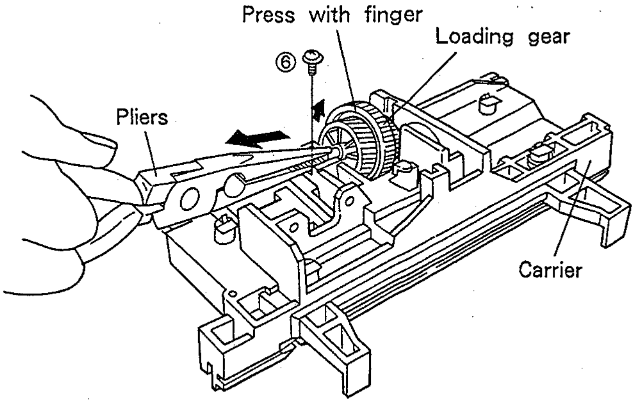

Press with finger
Loading gear
⑥
Pliers
Carrier

Fig.−16

Precautions on Installation

- Run the loading shaft through the loading gear as shown in the Fig−17, and insert to the carrier in the state of Ⓐ. And drive a screw after pressing the loading shaft with the tweezers, etc.

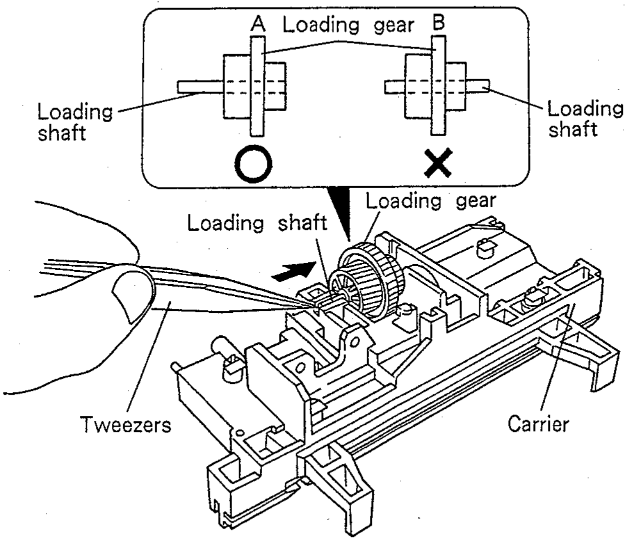
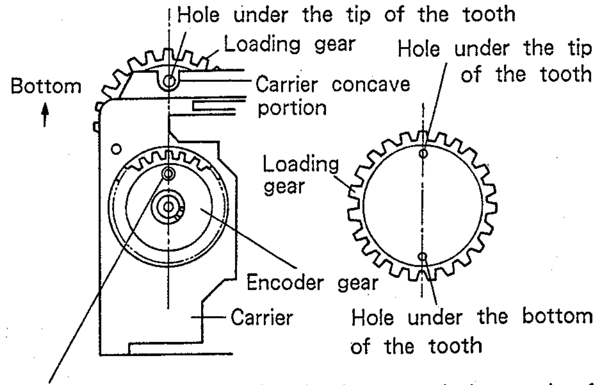

A Loading gear B
Loading shaft
Loading shaft
○
×
Loading gear
Loading shaft
Tweezers
Carrier

Fig.−17

- The following is the procedure to mount the encoder.

1. The holes inside the teeth of the loading gear are the state as shown in Fig−18, and match the hole under the tip of the tooth in two holes with the concave portion of the carrier. And install so that the hole of the encoder gear match with the hole under the bottom of the tooth of the loading gear. As shown in Fig−19 Ⓐ, after matching the convex portion of the encoder with ▼ mark, install the encoder by rotating itself in the direction of arrow while matching the screw hole with the concave portion of the encoder as shown in Ⓑ. Adjust the encoder position so that the left end of the encoder hole comes to the screw hole of the carrier as shown in Fig.−19Ⓒ, then fasten the screw. As shown in Fig−20, after assemble the carrier slider, etc., run the guide shaft through the carrier slider. Insert the guide shaft to section Ⓐ the upper rack while slanting it. And insert the slit of section Ⓑ of the carrier to section Ⓒ of the rib, and then, assemble so that the hole Ⓓ under the tip of the tooth of the loading gear matches with the notch portion Ⓔ of the upper rack.

   Mount the mechanism assembly, insert the cassette onto the first cassette tray for loading. At this time, confirm that the cassette is smoothly loaded through the center of the carrier.


Hole under the tip of the tooth
Loading gear
Hole under the tip of the tooth
Bottom
Carrier concave portion
Loading gear
Encoder gear
Carrier
Hole under the bottom of the tooth

Install so that the hole under the bottom of the tooth of loading gear watches with the hole of encoder gear.

Fig.−18

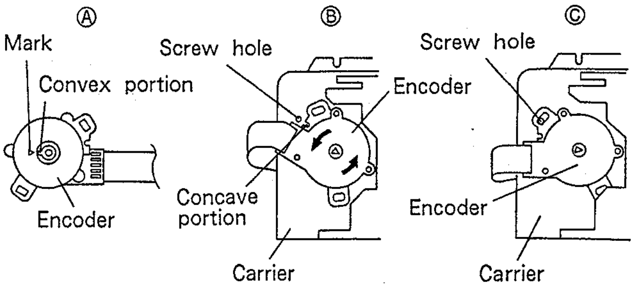

Ⓐ
Ⓑ
Ⓒ
Mark
Convex portion
Encoder
Screw hole
Encoder
Concave portion
Carrier
Screw hole
Encoder
Carrier

Fig.−19

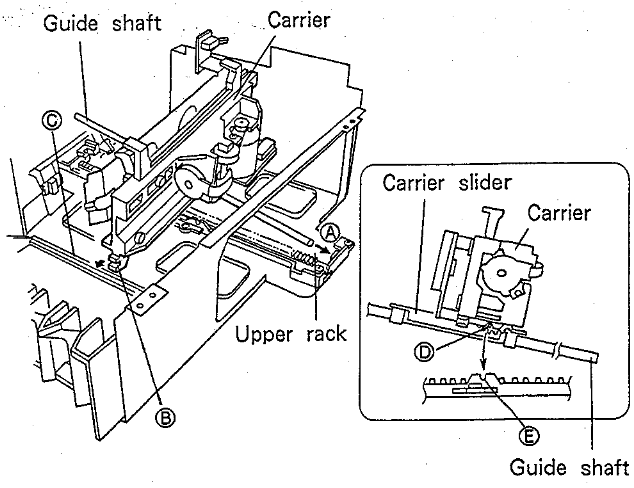
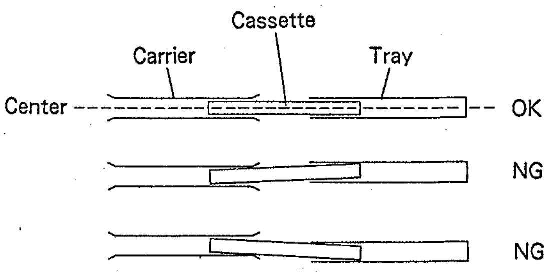

Guide shaft
Carrier
Ⓒ
Ⓐ
Upper rack
Ⓑ
Carrier slider
Carrier
Ⓓ
Ⓔ
Guide shaft

Fig.−20


Cassette
Carrier
Tray
Center
OK
NG
NG

REMOVAL OF UPPER UNIT

1. Remove the hooks of the upper holder, and remove six cassette arms. (Refer to Fig−21.)

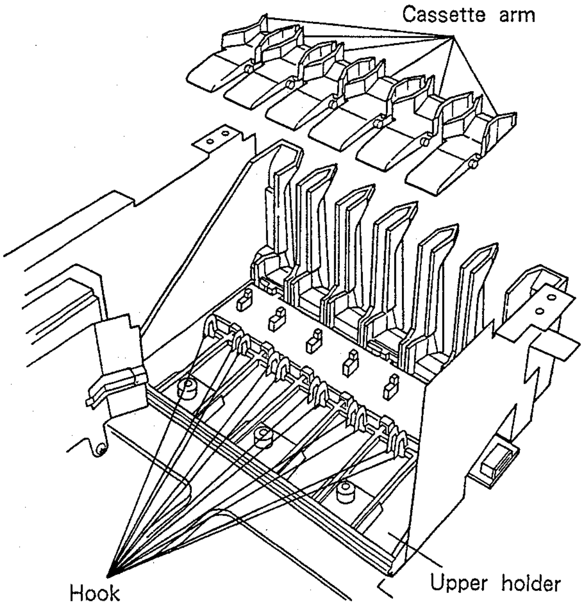

Cassette arm
Hook
Upper holder

Fig.−21

2. Remove three claws, and remove the upper unit. (Refer to Fig−22.)

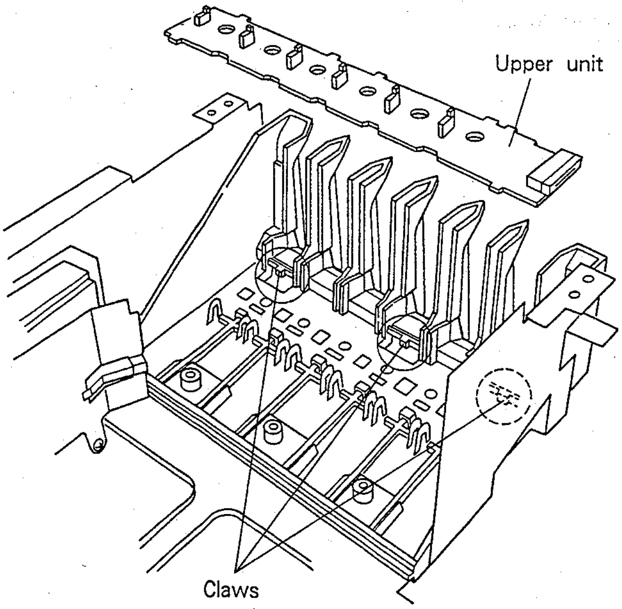

Upper unit
Claws

Fig.−22

REMOVAL OF TRAY−DETECTION SWITCH (Refer to Fig−23.)

1. Desolder six sections, and remove the switches respectively by removing the hooks of the switches.

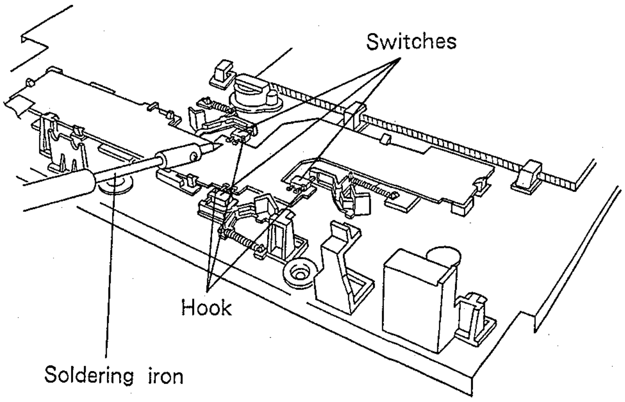

Switches
Hook
Soldering iron

Fig.−23

REMOVAL OF PULLEY GEAR, INTERVAL GEAR, TIMING BELT AND DRIVE GEARS A AND B (Refer to Fig−24.)

1. Remove the O/C belt from the motor pulley.
2. Remove the polyslider washer ①, and remove the interval gear.
3. Remove the polyslider washer ②, and remove the pulley gear.
4. Remove the polyslider washer ③, and remove the drive gear A.
5. Remove the polyslider washer ④, and remove the drive gear B.

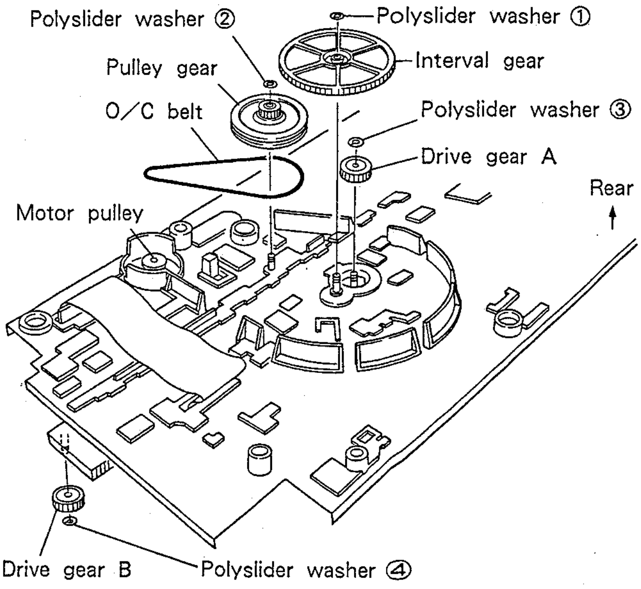

Polyslider washer ②
Polyslider washer ①
Pulley gear
Interval gear
O/C belt
Polyslider washer ③
Drive gear A
Rear
Motor pulley
Drive gear B
Polyslider washer ④

Fig.−24

Precautions on Installations (Refer to Fig–25.)

- When insert the tray assembly to the loading unit, match the third tooth of the rack of the bottom chassis with the shaft position of the rack plate.

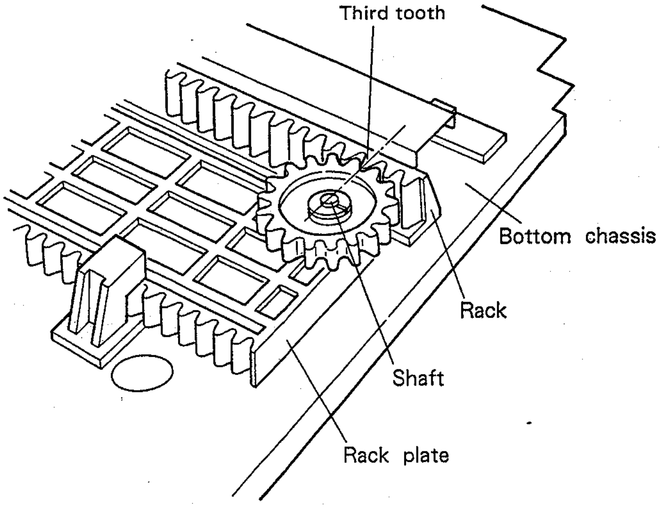
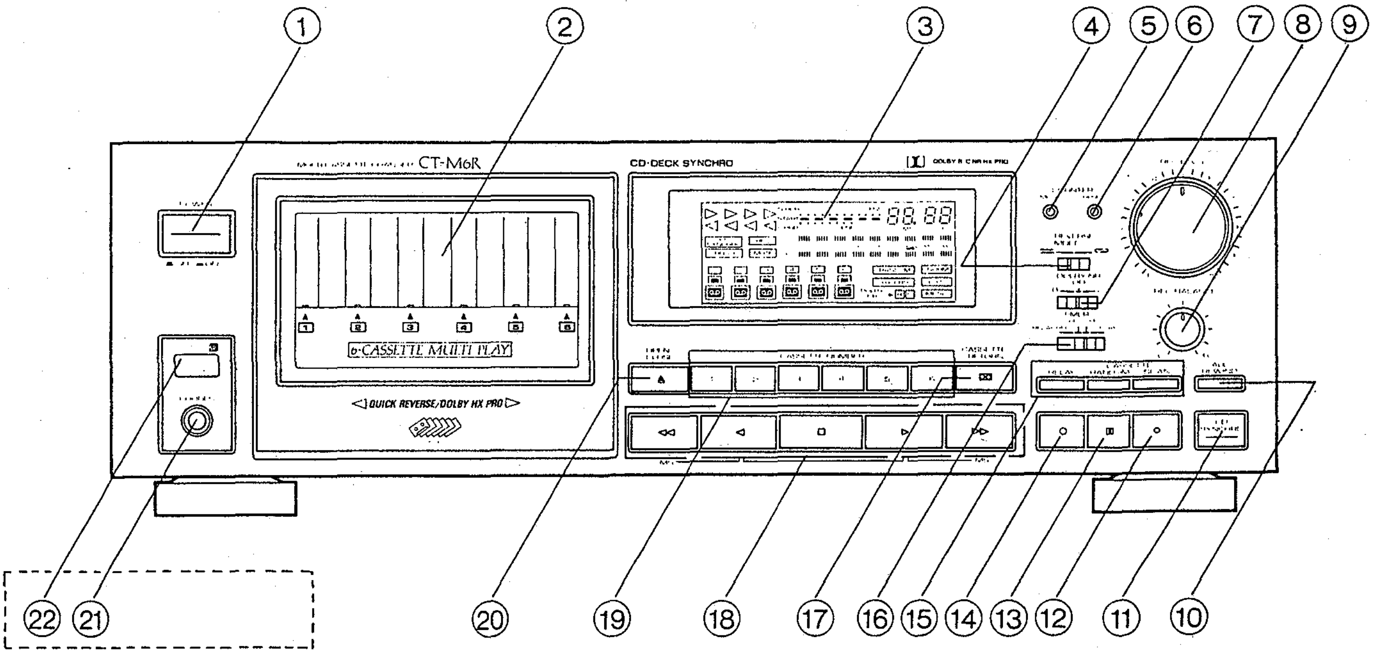

Third tooth
Bottom chassis
Rack
Shaft
Rack plate

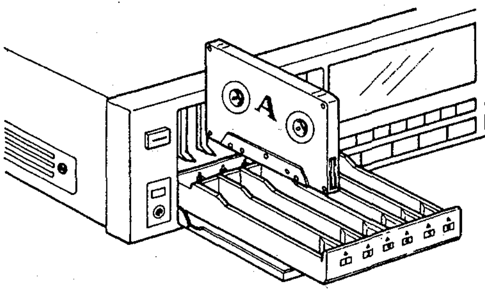
Fig.–25

12. PANEL FACILITIES



① **POWER switch**
Approximately 8 seconds after the POWER switch is pressed ON, the circuits become stable and operations can be carried out.

② **Cassette door and tray**
Press the OPEN/CLOSE button, and the door opens and the tray slides out. Insert the cassette so that the "A" side is on the left and the exposed (tape) side is facing down. When you press the OPEN/CLOSE button again, the tape tray will automatically close. Tape counter display shows OPEN when the tray slides out.



NOTE:
If the tray is open and contains a cassette, cassette loading and the following operations can be carried out automatically without pressing the OPEN/CLOSE button:
► : Forward play, ◄ : Reverse play, SCAN, RANDOM and ALL REWIND buttons.

Caution: Place the cassette tapes correctly on the tray and do not place anything other than cassette tapes on the tray.

③ **Display window**

④ **REVERSE MODE switch**
Choose the tape transport mode.
═ : Tape transport stops after one side of a tape is played or recorded.
When the RELAY button is pressed, play or recording continues on the next numbered cassette until the highest numbered cassette is reached.

⊂⊃ : During playback of the cassette you wish to hear, both sides of the tape are played back continuously until 16 sides have been played back.
In the record mode, both sides of the tape are recorded once and then tape transport stops.
When the RELAY button is pressed, after a cassette finishes, playback or recording continues on the next cassette until the highest numbered cassette is reached.

⑤ **COUNTER/MODE button**
Switches between the tape counter display and the time counter display.

⑥ **COUNTER/RESET button**
Sets the tape counter display to 0000 and the time counter display to 00.00.

⑦ **DOLBY* NR switch**
When in the recording mode, switch to B-type or C-type Dolby Noise Reduction, or to OFF.
When playing back Dolby NR-encoded tapes, always set this switch to the same position (B-type or C-type) used for recording.

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*

- *Dolby noise reduction and HX PRO headroom extension manufactured under license from Dolby Laboratories Licensing Corporation. HX PRO originated by Bang & Olufsen.*
- *"Dolby", the double-D symbol ᗡD and "HX PRO" are trademarks of Dolby Laboratories Licensing Corporation.*

⑧ **REC LEVEL control**

⑨ **REC BALANCE control**

⑩ ALL REWIND button

Press this button to rewind all tapes automatically, starting with the lowest numbered tape on the tray. The counter display changes to " AL L " during this operation.
If the tray is open, it will automatically close by pressing this button.

⑪ CD SYNCHRO button

This button is used to carry out CD-Deck synchro recording from a CD player.

⑫ Recording mute button (○)

When this button is pressed during recording, the deck creates a 4-second blank space on the tape and then enters record-pause mode.
When you hold this button down, a continuous blank space is created until you release this button.

⑬ Pause button (▮▮)

Press this button when it is desired to temporarily pause playback or recording. Press the button again to resume playback or recording. The pause button cannot be used during fast-forward or rewind. Recording can begin when this button is pressed after pressing the recording (●) button.

⑭ Recording button (●)

When this button is pressed, the deck enters record-standby mode. Recording begins when the play ▶ (or ◀) button or pause (▮▮) button is pressed.

⑮ CASSETTE control buttons

RELAY: Press this button to relay record or playback the cassettes on the tray. (The RELAY indicator lights.)

RANDOM: Press this button to playback all cassettes on the tray in a random order. (The RANDOM indicator lights.)
The unit will stop when one side (in the ⇄ mode) or both sides (in the ⟲ mode) have been fully played back.

SCAN: Press this button to playback each cassette on the tray for about 10 seconds starting from the lowest numbered cassette. (Counter display changes to " SC AN ")

NOTE:
If a blank section is played back for approximately 15 seconds, the blank skip function will come into effect. The tape is automatically forwarded to the beginning of the next selection and then playback begins.

⑯ TIMER switch

RELAY REC: Set to this position for relay recording by timer.

REC: Set to this position for a single cassette recording by timer.

OFF: Set to this position when not using the timer. (The switch should normally be set to this position.)

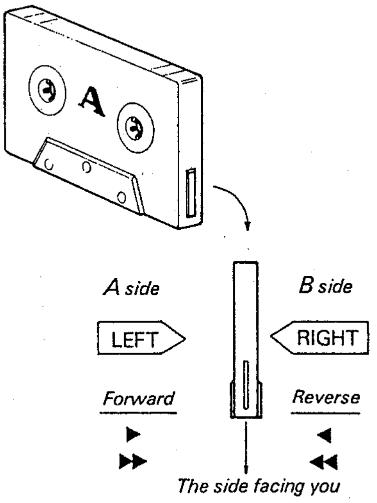
PLAY: Set to this position for playback by timer. Also set to this position for relay playback by timer with multiple cassettes.

⑰ CASSETTE RETURN button

Press this button to return the loaded cassette to the tray.

⑱ Operation buttons

NOTE:
Please keep in mind the illustration below to insure proper operation of your unit.



Fast-forward ▶▶:
When this button is pressed during stop mode, the tape is fast-forwarded in the direction of the arrows. When pressed during playback, the playback position skips forward by one selection for each press of the button (up to 15 selections), and playback resumes at the beginning of the designated selection.

Reverse play ◀:
Press this button to play back or record on the reverse side of the tape (the right side). (Reverse playback/recording)
Used to start recording in record-standby mode.
If the tray is open, it will automatically close and if a cassette is not loaded, the lowest numbered cassette will be loaded then playback will occur.

Stop ■:
Press this button to stop the tape transport.

Forward play ▶:
Press this button to play back or record on the forward side of the tape (the left side). (Forward playback/recording)
Used to start recording in record-standby mode.
If the tray is open, it will automatically close and if a cassette is not loaded, the lowest numbered cassette will be loaded then playback will occur.

Fast-reverse ◀◀:
When this button is pressed during stop mode, the tape is fast-forwarded in the direction of the arrows. When pressed during playback, the playback position skips forward by one selection for each press of the button (up to 15 selections), and playback resumes at the beginning of the designated selection.

⑲ CASSETTE NUMBER buttons (1 ~ 6)
Press one of these buttons to specify a cassette to be loaded from the tray.
Press one of these buttons and the Play (▶ or ◀) button to load a cassette and start playback.
Press one of these buttons and the recording (●) button to load a cassette and put in the record-standby mode.
Press one of these buttons and the fast forward (▶▶) or fast forward (◀◀) button to load a cassette from the tray and start fast-forwarding or rewinding.
If a play button (▶ or ◀) is pressed without one of these buttons, the lowest numbered cassette will be loaded and the operation will start.

⑳ OPEN/CLOSE button (⏏)
When a cassette tape has been loaded, you can change the cassettes on the tray except for the loaded cassette number. Use the OPEN/CLOSE button to open and close the door.

NOTE: This deck cannot operate the cassette tray without the power switch at the ON position.

㉑ PHONES jack

㉒ Remote Control Sensor Window

13. SPECIFICATIONS

System	4 track, 2-channel stereo
Heads	"Hard Permalloy" recording/playback head ×1 "Ferrite" erasing head ×1
Motor	DC servo motor (capstan) ×1 DC motor (reel, open/close, loading) ×3
Wow and Flutter	No more than 0.055% (WRMS) No more than ±0.16% (DIN)
Fast Winding Time	Approximately 100 seconds (C-60 tape)
Frequency Response	
−20 dB recording:	
Normal tape	20 to 17,000 Hz, ±6 dB
Chrome tape	20 to 18,000 Hz, ±6 dB
Metal tape	20 to 19,000 Hz, ±6 dB
Signal-to-Noise Ratio	
Dolby NR OFF	More than 58 dB
Noise Reduction Effect	
Dolby NR B type ON	More than 10 dB (at 5 kHz)
Dolby NR C type ON	More than 19 dB (at 5 kHz)
Harmonic Distortion	No more than 1.0% (0 dB)
Input (Sensitivity)	
LINE (INPUT)	63 mV (Input impedance 50 kΩ)
Output (Reference level)	
LINE (OUTPUT)	316 mV (Output impedance 5.8 kΩ)
Phones	0.25 mW (Load impedance 8 Ω)

Subfunctions

- DOLBY NR B/C types
- DOLBY HX PRO
- Music search over ±15 selections
- CD-Deck synchro recording capability
- Tape counter/Time counter
- Tape Remaining Time indicators (6 seg)
- FL peak level meter (8 seg + ∞)
- Automatic space recording mute
- One-touch recording pause
- Automatic tape selector
- Automatic reverse (Quick reverse)
- Phones jack
- TIMER Recording/TIMER RELAY Recording/TIMER Playback
- System remote control compatible
- Relay recording/Relay playback
- All rewind
- Cassette random playback
- Cassette scan playback

Miscellaneous
(CT-M6R)

Power Requirements	AC 120 Volts, 60 Hz
Power Consumption	25W
Dimensions	420 (W) × 136 (H) × 372 (D) mm 16-9/16(W) × 5-3/8(H) × 14-5/8(D) in
Weight (without package)	7.5 kg (16 lb 9 oz)

Accessories

Operating instructions	1
Connection cord with pin plugs	2
CD-Deck synchro control cord	1
System remote control cord	1
Remote control unit	1
Dry cell batteries "AAA" [IEC-R03 (UM-4)]	2

NOTE:
Specifications and design subject to possible modifications without notice due to improvements.